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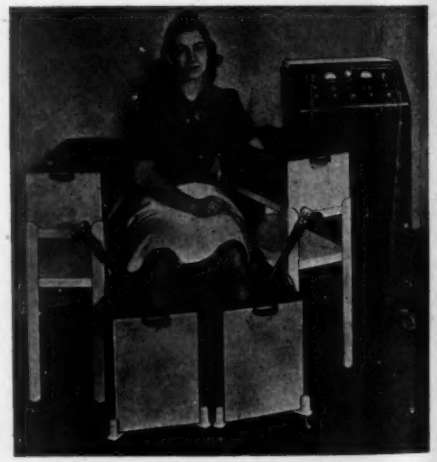

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PHYSICAL THERAPY IN RHEUMATOID ARTHRITIS *

B. I. COMROE, M.D.
PHILADELPHIA

Many conservative physicians look on physical therapy with distrust because of its wide exploitation by charlatans and quacks and because of exaggerated statements of its value by overenthusiastic persons. In general it is less well understood and less frequently employed by the internist than any other form of therapy. Little time is devoted to it in the average medical school, and most available courses are superficial and inadequate. It is unfortunate that one of the oldest and most useful branches of therapeutics is practically unknown to the average physician.

In arthritis physical therapy is merely an adjunct to other treatment and its injudicious use may cause harm, yet in most chronic forms of arthritis, physical therapy is one of the most important single factors in treatment.

Physical therapy should be used with care under direction of a physician. When limitations of budget so require, members of the patient's family must be instructed in the proper use of hot applications, massage and other procedures.

The physical therapy measures which have been found to be of most value in arthritis and allied conditions include heat in various forms, massage, hydrotherapy, active and passive movements, occupational therapy, roentgen therapy and, to a much lesser extent, heliotherapy, ion transfer, faradism and galvanism.

To be effective, physical therapy must be carried out daily for a long period. Each patient must be given a special prescription. If instructions are sufficiently detailed, the patient will usually continue treatment at home and become enthusiastic about the benefits derived.

Many physicians are at a loss to choose among the multitude of methods available. For rheumatoid arthritis, application of hot fomentations to acutely inflamed or subacutely inflamed joints has been the most universally prescribed modality. Moist heat appears to produce more relief in various forms of arthritis than dry heat, although the latter is frequently of value. Patients are usually grateful for the local application of heat. It relaxes muscles, increases local nutrition and the flow of blood and frequently relieves pain. In acute forms of arthritis, any form of heat may aggravate the local condition; in such cases, it should be discontinued or modified.

In the acute stage of rheumatoid arthritis, if the joints are hot, swollen and tender and if the patient can be made comfortable by the use of splints, rest and medication, heat is not applied. Hot wet packs or hot fomentations may relieve much of the pain, swelling and muscular spasm in acutely inflamed joints, more than compensating the physician and the patient for the time and the apparent inconvenience. One may apply hot wet dressings to the affected joints for periods of ten to thirty minutes several times a day. If hot fomentations result in further pain, they should be discontinued. If the weight of the wet dressings is painful, radiant heat, such as that from infra-red rays, may be applied for five to twenty minutes several times a day unless this aggravates the patient's symptoms. During the acute stage of arthritis, diathermy, or hot baths should not be employed, as they may aggravate the condition.

With improvement, and as the disease passes into the subacute or chronic

* From the Arthritis Clinic of the Hospital of the University of Pennsylvania.

stage (with less joint swelling, less tenderness on motion and a decreased sedimentation rate), heat is one of the most useful measures available. It should be applied to the affected joints several times a day and should usually be followed by massage of the muscular tissues between the joints, with only slight stroking of the joints themselves. If the disease is more or less generalized in this stage, one may use hot water baths, gradually bringing the temperature of the water from 95 F. to 100, 101 or 102 F. if this heat is tolerated. Patients remain in the bath from five to thirty minutes, according to their tolerance. If an exacerbation of symptoms follows within twenty-four hours after the bath, the bath should be modified or discontinued.

For involvement of individual joints in subacute and chronic rheumatoid arthritis, one may employ the common means of heating, such as bakers, ordinary small hand lamps, infra-red ray lamps, hot paraffin applications, contrast baths or diathermy. At home, patients may use a heat lamp for thirty minutes two or three times a day at a distance of comfortable toleration over the affected joints. Care to avoid burns must be exercised in applying any form of heat, particularly when there is diabetes, loss of sensation, scar tissue or impaired circulation.

Massage or active exercises are not employed during the acute stage except that each involved joint is moved several times through a full range of painless (nor nearly painless) motion two or three times a day to minimize the formation of dense adhesions.

When the patient with rheumatoid arthritis is confined to bed, muscle-setting exercises may be begun almost at once. These include voluntary contraction of muscles, including the quadriceps and the gluteal, eight or ten times several times a day or even every hour if this does not cause additional pain or fatigue. To avoid foot drop, care must be taken not to pull the covers tightly over the patient's feet. A pillow or cradle should be placed under the supporting sheet at the bottom of the bed so that the blankets do not rest on the feet. Deep breathing exercises (eight to ten times each hour while the patient is awake) are encouraged, and thoracic breathing should be done when possible.

With improvement, exercises should be increased gradually in range and duration, but not to the point of causing fatigue or pain. Proper massage can usually be begun as soon as the acute stage has subsided.

In the subacute and chronic stages of rheumatoid arthritis, the triad of heat, massage and graded exercises should be used in practically every case every day, whether the patient is in a hospital, at a spa or at home. The best form of heat is that which is the most comfortable and most convenient to the patient and at the same time produces the best results. The form may be varied several times a week until the one most nearly approaching this ideal is discovered. If the patient is at home, daily measures can usually be supplemented by massage by a trained masseur, warm baths, pool treatment and diathermy. One must never limit physical therapy to one or two diathermy or other treatments a week at the physician's office.

The physician or his assistant must take the time to explain in detail the role of physical therapy in the home to the patient and his family. Most poor results are due to the indifference or ignorance of the physician and of the patient.

Exercise is one of the least expensive and most valuable forms of physical therapy. Proper exercises require patience, perseverence and time on the part of both patient and physician; improperly performed exercises may cause definite harm. Unfortunately, many patients with rheumatoid arth-

ritis believe that the joints must be exercised as much as possible to prevent stiffness. This may cause irreparable harm. On the other hand, some physicians advise the patient to go to bed and remain there until joint swelling and pain have disappeared. This may result in muscular atrophy, weakness and contractures.

Exercise will decrease the tendency to muscular atrophy and will aid in preventing formation of dense adhesions in the joints. Such adhesions can usually be prevented by one or two daily painless movements of each joint. Movements which cause severe, persisting pain should be avoided. It is much better to carry one movement through a full range of motion than to perform a series of shorter movements. If the patient experiences an increase in pain, swelling or stiffness in his joints within twenty-four hours after the exercises, these should be modified.

Active exercises are not begun until the joint is without pain while at rest. As the patient improves, the amount of exercise may be increased and modified. Active movement is always preferable to passive movement. A joint should never be forced; this may result in a flare-up of a smoldering arthritic process.

Muscle-training exercises are of extreme importance and must be performed whether or not the patient is confined to bed. They should be increased according to toleration and should employ chiefly those muscles which combat deformity—namely, the extensors, the abductors and the external rotators. They may be begun with a few contractions each hour and may be increased to five minutes or more per hour so long as they do not produce pain or fatigue. Such exercises should be followed in time by active assisted exercises, then by exercises without weight bearing and finally by weight-bearing exercises. Proper exercises never increase the activity of the arthritic process. Even in the more chronic stages, exercise periods should not exceed thirty or forty minutes. The occurrence of muscular spasm during exercise is a signal for cessation of the movement.

Exercises should be performed slowly. Rapid motion quickly produces fatigue, and sudden, rapid, jerky movements may result in further damage to arthritic joints, leading to additional muscular spasm (with loss of muscular power, elasticity and contractility). Muscle-setting exercises (in which the muscle is tightened without producing motion) will increase the muscular tone.

*Massage is one of the most useful, easily obtained and frequently neglected methods of physical therapy in arthritis. Proper massage requires the assistance of one trained in this field.

It is a medical art founded on physiologic and anatomic knowledge and should not be used as a tool for charlatans or as a black art. It is not mere rubbing but is a series of manipulations best performed manually with an exact technic.

Unfortunately, some physicians consider it below their dignity to massage an involved limb or even to instruct a member of the family in this procedure. Although massage by trained physical therapists may be expensive, it should be carried out if possible. Our next aim should be to train the general practitioner not only in the mechanism of massage but in its usefulness in various conditions. Massage mechanically assists the circulation in the venous system and aids in the movement of lymph. The resultant vasodilatation assists in the absorption of inflammatory or waste products. Massage is an extremely useful weapon in preventing muscular atrophy.

Unless contraindicated, every patient with nonacute rheumatoid arthritis deserves proper massage. Contraindications include acute inflammation of a joint; a

temperature of more than 100 F.; suspicion of a local malignant process; phlebitis; lymphangitis; increased swelling, pain and stiffness in the joints persisting for more than an hour after massage; acute burns or acute dermatitis; persistent hypertension or advanced atheroma of blood vessels, and suspicion of osteomyelitis or tuberculous lesion of bone. Abdominal massage should not be carried out if there is a suspicion of intra-abdominal organic disease.

In the subacute stage of rheumatoid arthritis, one may begin with gentle stroking and later use deeper stroking motions, kneading and friction of the surrounding muscles for ten minutes twice a day; superficial, very light stroking may be begun over the joint itself. All movements should be slow and rhythmic. Such massage is best performed after at least fifteen minutes of application of heat to the tissues. One must never cause pain with massage. Approximately five to ten minutes of massage is required for an arm, ten minutes for a leg and ten to fifteen minutes for the back. If multiple joints are involved, all of the area may be included in the massage.

The patient should be told that it is almost impossible to massage oneself well. One of the best ways to acquire the proper technic for massage is to have several treatments from a good masseur. During the massage, the room temperature should be approximately 70 F. and only the portion of the body being treated should be exposed, the remainder being covered by a sheet or blanket. Both the operator and the patient should be comfortable and the patient should always be recumbent, to take advantage of gravity. The joint must always be relaxed and comfortable and any constricting bands or clothing should be removed. The hands of the masseur must be soft, warm and dry and must possess some strength. If hairy parts must be massaged frequently, it is advisable to shave the skin to avoid irritation.

Hydrotherapy is valuable in the treatment of the arthritic patient, but it is contraindicated in acute rheumatoid arthritis because of the probability of fatigue and exacerbation. Underwater therapeutic exercises are effective in stimulating flabby muscles and in restoring their use. The buoyancy of the water and its efficiency in overcoming the force of gravity are the greatest advantages of underwater treatment. As the specific gravity of water is about the same as that of the body, the weight of the latter is almost completely carried by the sustaining power of the water, thus permitting greater freedom of movement and hastening the process of rebuilding atrophied muscles. Discovery by a patient that he can readily move limbs immersed in water which he could not move while in bed has a tremendous stimulating effect on his morale. The physician must remember that buoyancy is present in any water whether it is at the most expensive spa or in the cheapest homemade pool or tub bath.

For patients with rheumatoid arthritis of multiple joints, one may employ hot baths at a temperature of 100 to 102 F. for five to twenty minutes with the patient moving all of his affected joints while submerged in the bath. Such baths may be given every day or every other day as tolerated. On the alternate days, baking, massage and passive and guarded active movements for the upper and lower extremities and the neck may be carried out.

The hot bath is useful in subacute or chronic generalized rheumatoid arthritis, although some arthritic patients, particularly those who are emaciated and weakened, do not tolerate exposure to heat and are easily exhausted from prolonged hot baths. In most cases the water should be about 98 F. when the patient enters the tub; the temperature may be gradually raised to 102 F. or, occasionally, to 105 F. The first bath should never last more

than four to six minutes and should be given at least two and one-half hours after a meal. One or two pounds of sodium chloride may be added to each 20 gallons of water; some patients prefer baths containing an ounce of pine extract to each 20 gallons. Several cupfuls of magnesium sulfate added to the water may result in greater comfort to the patient and add an important psychologic factor; patients will readily submit to such baths while not appreciating the value of warm water alone. The length of subsequent baths may be increased to fifteen or twenty minutes if no exacerbation of joint symptoms and no undue weakness results. A cool, wet towel placed around the head will tend to lessen the patient's discomfort. After the bath, the patient should be sponged with alcohol, dried well and returned to bed wrapped in a light blanket without exposure to drafts.

Fluids must be given freely after the bath (or during the bath if marked sweating occurs). If there is excessive perspiration, 2 to 6 tablets of sodium chloride (1 Gm. each) may be given. All patients should rest in bed for at least an hour after the bath.

Whirlpool baths are useful in treating chronic rheumatoid conditions of the upper or lower extremities. The aerated water produces peripheral vasodilatation, soothes peripheral nerve endings and induces muscular relaxation.

Hot foot or arm baths may be given by using a large bucket or specially constructed container. The water should be 100 F. at first, the temperature being gradually raised to 105, 110, or 115 F. if this heat is tolerated. The affected part should be kept in the bath for twenty to forty minutes.

In subacute or chronic cases, if it is impossible to move the patient to a tub, a hot full wet pack may be of value.

Unfortunately, contrast baths are used but little in general practice. They are valuable, simply to carry out and afford symptomatic improvement in many cases. They frequently have a more analgesic local action than heat alone and may be used in the treatment of stiff, painful joints.

Hot paraffin applications are an effective method of applying heat to individual joints. If the hands are involved, eight to ten layers of paraffin may be applied and allowed to remain in place for thirty to sixty minutes with the part wrapped in a warm towel or blanket. The paraffin is then peeled off and replaced in the inner container of the double boiler to be used at the next application.

Systematically performed baking combined with massage may work wonders in the treatment of painful knees, shoulders and other joints. Unfortunately, too many persons look on this as an office or hospital procedure, although an effective baker may be built cheaply for the home. The patient's heat tolerance must not be exceeded and care must be taken that the electric bulbs and hot metal do not come into contact with the skin. Baking of an arm or leg should last approximately thirty to forty-five minutes unless this is not well tolerated. The heat should never be allowed to burn or blister the skin. Care must be taken not to chill the part immediately after baking. A period of rest equal to that of the baking and massage should follow.

Simple inexpensive heat lamps have been devised for local application of dry heat. In some communities it may still be necessary occasionally to use older means, such as the heated bag of sand, bricks, salt or iron. Electric heating jackets have been devised which should be of benefit.

Electric cabinet baths may be used in the office or hospital for robust patients with fibrositis or diffuse rheumatoid arthritis. Treatments last from five to fifteen minutes and are usually followed by a warm shower

and light massage. The patient should then lie down and rest for at least forty-five minutes to an hour.

General heliotherapy may be of tonic value in chronic cases. Only small areas (not over one-fourth of the body) should be exposed at a time at the beginning of treatment. If ultraviolet radiation is used, treatment should be given every second day, because it requires about forty-eight hours for the erythema to reach its maximum. Ultraviolet irradiation or heliotherapy are not advisable in most acute cases because of the possibility of increasing activity in the joint process. If direct sunlight is used, the initial treatment should consist of approximately five minutes anteriorly and posteriorly, and treatments may be given daily if no untoward symptoms result. Exposure is increased five minutes anteriorly and posteriorly until it totals one hour each day if this is tolerated. Ultraviolet light is not used to produce local heat in the joints, as its chief effect is a general tonic one on the organism as a whole.

Infra-red rays are also useful in providing temporary relief of swollen joints. Such radiation is more economical, easier to manipulate and to control and less dangerous than short wave diathermy. The part being treated is more easily inspected if infra-red radiation is used and the effectiveness of the treatment may be increased by application of hot wet compresses or counterirritants. The radiation may be applied several times a day, the maximum heat which the patient can endure being focused on the painful joints for fifteen to thirty minutes. One must always avoid blistering of the skin.

Diathermy is the most efficient method of heating deeper tissues and is particularly valuable in treating the spine and large joints. It may be indicated for contusions, muscular strains, sprains, tenosynovitis, chronic forms of arthritis, myositis and fibrositis. In some cases of acute bursitis, pain is relieved by short wave diathermy, while in others, exacerbation results (and diathermy must be discontinued).

Most authorities concede that the effects produced by diathermy are due solely to the generation of heat and not to any specific biologic or bactericidal action. Diathermy is contraindicated in most cases in which there are acutely inflamed joints. The average effective duration of a diathermy treatment in chronic cases is approximately twenty to thirty minutes. Caution must be taken never to apply the electrodes over scar tissue or to broken skin. Diathermy machines should be operated only by persons adequately trained in this work. One should not rely on the instructions given by salesmen of the machines. Diathermy in chronic arthritis should always be supplemented by other forms of heat applied two or three times a day. If diathermy seems to aggravate the local symptoms it should be discontinued. The patient should not be allowed to regulate the current. In middle-aged patients with bilateral degenerative joint disease of the knees or hips, rest and proper administration of diathermy often assist in producing marked relief of symptoms.

SPA TREATMENT OF RHEUMATIC DISEASES IN THE UNITED STATES

III. Representative Spas

RICHARD KOVÁCS, M.D.

NEW YORK

Hot Springs National Park

Hot Springs National Park, an area comprising approximately 1,019 acres, is located at Hot Springs, Ark., in the south-central section of the state and in the eastern portion of the Ouachita Mountains (fig. 1). Eleva-

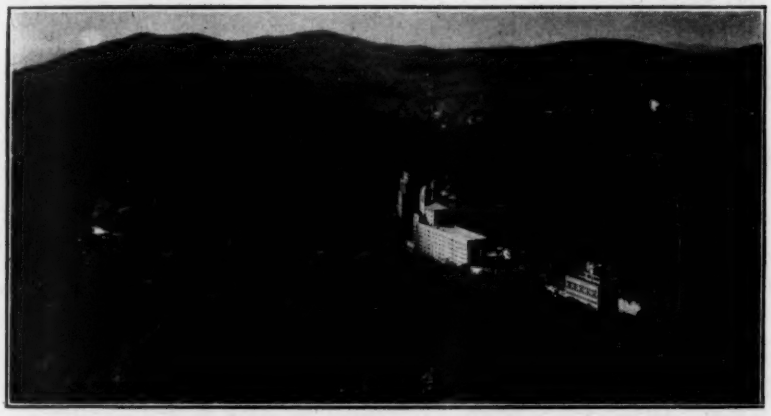

Fig. 1. — Hot Springs National Park from the top of Hot Springs Mountain. The intermountain portion of the view shows part of the city of Hot Springs (Arkansas).

tions within the park vary from 600 feet to 1,200 feet above sea level. Winters are mild, so that outdoor recreation is usually comfortable, while the heat of summer is moderated by the rugged hills, which are covered with forests of pine and mixed hardwoods.

The park is a unit of the United States National Park Service and is actually a national spa and recreational area. The officer in immediate charge is the superintendent.

There are no hotels or other living accommodations in the Federal area, but in the adjoining city of Hot Springs many hotels, tourist courts, apartments and boarding houses, in addition to hospitals and sanatoriums, are available for patients seeking to take the hot water treatments.

Situated in the park area at the base of Hot Springs Mountain are 47 hot springs with a flow of approximately a million gallons a day. All the springs except one display spring are covered and their waters impounded in reservoirs, from which water is supplied to bathhouses and therapeutic pools. The temperature of the water in the central collecting basin is always over 140 F.

The natural hot mineral water is highly palatable, and numerous drinking fountains are available for the free consumption of the water by visitors. Government regulations, however, do not permit the bottling and shipment of the water. The cost of the bath treatments in the several bathhouses and hydrotherapy pools is simply a charge to cover the services rendered and is not a charge for the waters. Rates vary according to the type of accommodations provided, but the water and the routine of the baths are the same in all houses. There is a free bathhouse for use of persons unable to pay.

The approximate chemical composition of the Hot Springs waters is as follows (parts per million): silica 45, iron 0.05, manganese 0.26, calcium 46, magnesium 5.8, sodium 5.1, potassium 1.6, bicarbonate 165, sulfate 9.1, chlorine 2.1, fluorine 0 and nitrate 0, with total dissolved solids, 197. Gases in cubic centimeters per liter at O. C. and 760 mm. pressure are nitrogen 8.8, oxygen 3.8, free carbon dioxide 6.9 and hydrogen sulfide none. Radioactivity is 0.45 millimicrocurie per liter.

There are eight bathhouses in the Federal area along famous "Bathhouse Row" (fig. 2) and eight in the adjoining city of Hot Springs.

Fig. 2. — Bathhouse Row at Hot Springs National Park (Arkansas).

Foot trails, bridle paths and scenic mountain drives are available within the park. Water sports and fishing are to be found on Lakes Hamilton and Catherine in the adjacent Ouachita River Valley, and there are numerous lakeside resorts along the Ouachita River. A golf course is maintained by private interests for the use of visitors to Hot Springs. There is a museum in the Administration Building, with geologic and other displays, and there are self-guided nature trails, with interesting trees, rock exposures and other natural features labeled at the wayside.

The mineral waters are taken internally and used externally as underwater treatments in tub baths, sitz baths, vapor cabinets and therapeutic pools. The customary, or "standard," bath is a neutral bath of about 15 minutes' duration, with the water at 98 to 100 F. The bather drinks freely of the hot, mineral water during the bath, while the attendant gives a vigorous massage followed by a rubdown. Then the patient is given hot packs in a hot room, followed by a cooling shower and rest period while reclining in a cooling room. This is the form of bath customarily taken by visitors to the park who desire relaxation or seek recuperation and may be taken without a physician's directions.

The thermic physical therapy pools at Hot Springs are used primarily for muscle reeducation in cases of paralysis and for the treatment of arthritis. Only qualified physical therapy technicians give the treatments. Facilities are available in all the bathhouses for persons desiring massage treatments.

While the baths may be taken without the advice of a physician by procuring a permit at any of the bathhouses receiving water from the hot springs in the park, this practice is not recommended. The waters are not beneficial in all diseases and in some are harmful. In many ailments the baths will not afford material benefit unless taken in connection with proper

medicines prescribed by a physician. The only physicians allowed to prescribe the waters are those licensed practitioners of the State of Arkansas who have been examined by a Federal board of medical examiners appointed by the Secretary of the Interior. This rule is for the protection of visitors, who may secure a list of qualified practitioners at the information desk in the Administration Building before employing a physician.

Patients with cardiovascular disorders, rheumatic and arthritic conditions, disorders affecting the gastrointestinal tract, including the liver and gallbladder, nervous conditions, and disorders of metabolism, such as gout and obesity, are treated.

Approximately 35 per cent of the patients treated have arthritis. The program prescribed for these patients usually consists of baths alone or of baths and accessory treatments, such as local heat applications, vapor cabinet treatments, sitz baths and massage. The prescribing physician also outlines the internal use of the mineral waters, any dietary regulations, exercise, rest and recreation. The patient follows the program for three to four weeks and sometimes returns for a second course of treatment during the year.

It is necessary for bed patients to avail themselves of the facilities of the hospitals and sanatoriums which give bath treatments, as patients taking treatments in bathhouses and pools not connected with hospitals and hotels must go back and forth by bus or car. Also, they must be able to assist themselves to some extent in getting into and out of the bathtub or provide their own assistants.

Fig. 3. — "White sulfur water" drinking temple at Sharon Springs (New York).

Sharon Springs

Sharon Springs, four and one-half hours from New York City, is situated on the Mohawk plateau, 1,300 feet above sea level. It has a healthful, invigorating atmosphere and is located in what is known as a sunshine belt

(most of the rainfall coming at night), with warm sunny days and cool nights.

The spa is privately owned and operated by the White Sulphur Company of Sharon Springs, N. Y., Inc.

Within a comparatively small space there are four springs: the White Sulfur (fig. 3), Magnesia, Eye and Iron Springs. The White Sulfur water is used in all baths and internally. The Magnesia water is used internally as an alkaline water and a mild laxative. The Eye water is used internally. It contains many minerals and is easily digested. It is also used as a soothing eyewash. The Iron water is used internally as a tonic and for its diuretic effect.

The physical plant consists of six bathhouses in which various forms of treatments are given. There are a nine hole golf course, a swimming pool and many trails through the woods. Many hotels and boarding houses are located within a short distance of the baths.

Internal use of the waters is prescribed to maintain normal alkalinity of the blood and encourage tissue change. According to historical records, the flow and composition of these springs have never changed. The White Sulfur Springs flow at a rate of 197,000 gallons daily, at a temperature of 44 F.

Inhalations of vaporized sulfur water benefit sinus and throat conditions and may thus have an effect on the source of infection in arthritis. Sulfur water baths produce greater stimulation to the skin and at lower temperature than plain water; also there may be some absorption of sulphuretted hydrogen by the skin.

In full steam massage treatment the patient has a sulfur bath and then is placed on a frame made of cane and fitted over the bathtub, through which steam can pass. This arrangement allows the patient to lie in a perfectly relaxed condition while being massaged. Massage is followed by a stimulating cold or Scotch douche. Then the patient is wrapped in blankets and allowed to perspire.

Other accessory treatments are hot moist packs, mud packs and Nauheim baths.

Sharon Springs is essentially a medical institution for the treatment of arthritis. About 90 per cent of all treatments given are for some type of rheumatic trouble. Chronic skin diseases, cardiac disorders and nervous ailments are treated to some extent. European methods of using sulfur water in rheumatic conditions were introduced in this country at Sharon Springs in 1884, with the assistance of Dr. Blanc, government inspector of the sulfur baths at Aix-les-Bains, France. All the treatments are given by skilled attendants as prescribed by either the patient's own physician or a resident physician who specializes in this work. The course of treatment for the arthritic patient consists usually of twenty-one baths, with or without massage, hot packs, mud baths or other accessory treatment. The internal use of the waters and dietary regulations, exercise, rest and improvement of the patient's morale are important. There are no provisions for bed patients.

The medical director is Dr. L. O. White.

Marlin Spa

The Marlin spa is located 28 miles south of Waco, Texas, on the Southern Pacific and Missouri Pacific Railways. The climate is mild in winter and not too hot in the summer. There are two large hotels and two clinics and bathhouses. The baths provided are similar to those given for chronic diseases at other health resorts. Conditions treated include arthritis in all of its forms, sciatica, degenerative diseases, such as diabetes and nephritis, and gallbladder trouble with chronic gastritis and constipation. The water is an alkaline laxative.

Analysis of the water shows that it has over 500 grains per gallon of mineral content. It is soothing in skin diseases, relieving itching quickly. The hot mineral water has not changed its composition more than 7 grains in the past fifty years according to recent analyses. All modern hydriatic treatments are given in each of the bathhouses, in particular vapor baths, hot and cold douches, sprays, shower baths and tub baths, as well as friction massage. Each bathhouse has complete physical therapy equipment, including several machines for giving sinusoidal and galvanic electrotherapy, short wave and long wave diathermy and colonic irrigation with the mineral water. Swedish massage is also given.

The baths are under the direct supervision of physicians who have had many years of experience in diagnosing and prescribing for the chronic diseases observed at the spa.*

The hotels and restaurants of the town cater to patients who have special diets prescribed. Rolling chairs are furnished those who do not wish to live in the hotels connected with the bathhouses.

The Crippled Children Hospital belongs to the Torbett Clinic and Hospital but is not in operation at present and will not be until the war is over. It has thirty-five beds and a rather large pool using the hot mineral water, a Hubbard tub and modern physical therapy equipment.

The chief medical director is Dr. J. W. Torbett, fellow of the American Congress of Physical Medicine.**

* Each has a clinic with a staff of 8 physicians.

** Comment received too late to include with article, continued on page 729.

EDITOR'S NOTE: This is the last of a series of three articles, of which the first two appeared in the Sept. and Oct. issues of the ARCHIVES.

PALINDROMIC RHEUMATISM *

W. D. PAUL, M.D.

and

T. L. CARR, M.D.

IOWA CITY

Recently Hench and Rosenberg[1] described a new type of arthritis which they called "palindromic rheumatism." Only 39 cases have been reported to date. It is possible that this form of joint disease may occur more often than the literature suggests. We feel that a review of the cases so far reported may stimulate the physician to recognize this syndrome.

It is an arthritis, periarthritis and frequently para-arthritis usually of one, but often of more than one, joint. The attacks appear suddenly and are characterized by pain, redness and swelling. There is little or no general reaction, and, unlike rheumatoid arthritis, it causes no rise in body temperature. The symptoms last from a few hours to several days and terminate spontaneously. Thus far the condition has not been described in children. Usually only one joint is involved at any time, and recurrences may affect the same or different joints at unpredictable intervals. In spite of innumerable recurrences, there is no evidence that any permanent joint damage ever occurs.

In 1941, and again in 1944, Hench and Rosenberg[2] reported a total of

* From the Department of Internal Medicine, Division of Physical Medicine, State University of Iowa.

1. Hench, P. S., and Rosenberg, E. F.: Palindromic Rheumatism, Proc. Staff. Meet., Mayo Clin. 16:808 (Dec. 17) 1941.
2. Hench, P. S., and Rosenberg, E. F.: Palindromic Rheumatism, Arch. Int. Med. 73:293 (April) 1944.

34 cases which had been seen at the Mayo Clinic since 1928. They felt that this disease was rare, for only 5 or 6 cases were recognized yearly out of 4,000 to 4,500 instances of "rheumatism." Seventy per cent of the patients ranged in age from 20 to 39 years; 15 were males and 19 were females. The most striking feature in their series was the great frequency of irregularly recurring, short, afebrile attacks, each with complete symptomatic remission. A minimum of twenty-three attacks per year per patient was reported for the series. The symptoms lasted from a few hours to three days in 76 per cent of the group. The periods of remission lasted from a few hours to a year or more, and the average duration was one to two weeks. As a rule only one joint was involved at a time. Almost any joint in the body was likely to be involved, in the following order of frequency: the fingers (proximal phalangeal or metacarpophalangeal, occasionally the terminal phalangeal, joints), wrists, shoulders, knees, toes and elbows.

The attacks occurred at any time of the day or night. The onset was sudden; pain and swelling developed within about an hour and reached maximal severity within a few hours. Severe pain and articular swelling resulted in considerable disability and limitation of activity. Even though the arthritis recurred at frequent intervals, there was no loss of appetite or of weight and no elevation of temperature.

The hemoglobin and erythrocyte and leukocyte counts were normal. In a few instances the total leukocyte count was slightly or moderately elecated, either during or between the attacks. The differential leukocyte count was often normal, but there was a tendency toward either relative lymphocytosis or polymorphonuclear leukocytosis. There was no increase in the eosinophils. The concentration of uric acid in the blood was normal, averaging 3.4 mg. per hundred cubic centimeters. In 9 of 10 cases the total blood lipids were determined during the attacks and the content found to be above normal. The average sedimentation rate was only 24 mm. (Westergren method) in one hour. Roentgenograms were obtained in over 90 per cent of the cases, but no abnormalities were found. The few articular changes which were noted were regarded as coincidental. Season and weather, menses, work, fatigue, trauma, infection, sensitivity to food, allergy and angioneurosis were not predisposing or precipitating factors.

Thompson[3] reported 2 instances of this type of articular disease in members of the armed forces. Both of these young men had many attacks, but no residual changes could be found. Thompson was unable to discover any etiologic agent. Cain[4] also, described this condition in a young soldier. His patient was nervous and irritable and had mild insomnia. The attacks recurred once or twice a week for many years and involved mostly the wrists and ankles. Mazer[5] reported one case of a man who had had many painful attacks in previous years. He suggested no etiologic factor, but felt that psychosomatic stimuli might precipitate an attack.

Paul and Logan[6] observed a woman 49 years of age who had had many attacks of joint disease since 1941. Some of these were so severe that she was confined to bed. Often with the arthritis she would have signs of pararthritis, consisting of the sudden appearance of indurated red patches on the skin, varying in diameter from 1 inch to several inches. The patient volunteered the information that nervousness or anger would usually precipitate the arthritis. While the patient was under observation, swelling

3. Thompson, J. L., Jr.: Palindromic Rheumatism: Report of 2 Cases, M. Ann. District of Columbia 11:189 (May) 1942.
4. Cain, James C.: Palindromic Rheumatism, J. A. M. A. 125:1037 (Aug. 12) 1944.
5. Mazer, M.: Palindromic Rheumatism, J. A. M. A. 120:364 (Oct. 3) 1942.
6. Paul, William D., and Logan, William P.: Palindromic Rheumatism, J. Iowa M. Soc. 34:101 (March) 1944.

of both wrists developed with para-arthritis over the dorsum of the right hand. These symptoms subsided spontaneously within forty-eight hours and were not influenced to any extent by the administration of cinchophen or by physical therapy. After leaving the hospital, she reported that the attacks were continuing at about the same tempo and severity.

Report of a Case

R. H., a white man aged 51, was admitted to the University Hospital Feb. 2, 1944. During childhood he had an amputation of the terminal two phalanges of the left middle finger and partial amputation of the terminal phalanx of the left thumb as the result of an accident. Appendectomy and tonsillectomy were performed in 1925. About 1930 he began to consume a great deal of alcoholic beverages, and what he called "nervous trouble" developed. On several occasions he "lost consciousness," but these spells did not recur after he was treatd at a "clinic." He had worked as a laborer, changing jobs frequently. He had no further difficulty until 1941, when a hernioplasty was performed. Shortly after this, a sudden pain developed in the right shoulder. No redness or swelling was noted, but he did have pain on motion. The disability persisted for twenty-four hours, and some pain was present for thirty-six hours, at the end of which time it terminated suddenly. Heat was applied during the height of the pain without any relief. Two weeks later the right wrist became swollen, slightly reddened and painful on motion. The joint remained swollen for several days, but the pain, erythema and swelling lasted nearly a week, when they terminated abruptly. Thereafter until June, 1942 he had multiple attacks involving isolated joints and characterized by pain and with some limitation of motion. Usually only one joint was involved at a time, and the disease showed no particular predilection for any one joint. The wrists and hands were involved more often than the others. An attack would last from twenty-four hours, at the end of which time no pain, limitation of motion, erythema or swelling would remain. After one of these acute illnesses, he would remain free of symptoms for twenty-four hours to three weeks, when the same or some other joint would become involved. He estimated that he had had fifteen such attacks from December, 1941 to June, 1942. He had no further difficulty until November, 1942, when the symptoms recurred, migrating from joint to joint at irregularly spaced intervals. During the winter of 1943-44 he had some joint involvement at least once a week. The duration, severity, course and lack of residual symptoms were as previously described.

Physical examination at the time of admission revealed that the patient was well developed and well nourished and not acutely ill. The oral temperature was 98 F. and remained normal during his entire hospital stay. The pulse rate was 80 a minute and the respiratory rate 24. The blood pressure was 140 systolic and 88 diastolic with the patient in the supine position. He weighed 180 pounds on admission. The head was not remarkable; the sclera and conjunctiva were normal; the extraocular movements were full and intact. The pupils were circular and regular and reacted to light and in accommodation. Ophthalmoscopic examination gave negative results. The ears were normal. The nasal septum was intact, and the air passages were adequate on both sides. Some of the teeth were missing. The neck was not stiff or painful on motion. Examination of the chest and heart showed nothing abnormal. Abdominal examination revealed nothing but well healed scars in the right lower quadrant and the right inguinal region. The external genitalia were normal. Rectal examination revealed a small, nontender prostate. The skin was normal except for several seborrheic warts over the back. Both the upper and the lower extremities were essentially normal, except for amputations of fingers as already noted. The small joints of both hands were not enlarged, and motion was not limited. The skin over the joints was elastic and of good texture, and the intrinsic muscles were not atrophied. There was no evidence of ulnar deviation. No crepitation was noted in the larger joints. The other joints of the body, including the spine and temporomandibular joints, were entirely normal. Complete neurologic examination revealed nothing abnormal.

Laboratory Examination. —The specific gravity of the urine was normal; the chemical reactions for dextrose, albumin and hemoglobin were negative. The urinary sediment showed only a few epithelial cells and an occasional leukocyte. The Kolmer and Kline reactions of the blood were negative. The hemoglobin content of the blood was 14 Gm. (Haden-Hauser); the erythrocyte count was 4,420,000, and the leukocyte count was 6,500. The differential leukocyte count showed nothing abnormal, and there was no variation in the size, shape or staining of the erytherocytes. The sedi-

mentation rate was 18 mm. in sixty minutes (Westergren method). The uric acid content of the blood was 3.4, the urea nitrogen content 11.2, the creatinine content 1.0 and the fat content 500 mg. per hundred cubic centimeters. Roentgenograms of the hands, wrists, knees and temporomandibular joints revealed no evidence of arthritis or other bony disease. The patient was tested intradermally with the common pollens, food, hair, feathers and spores. He reacted mildly to canary feathers, hog hair, horse dander and house dust, but this was not considered of any consequence.

Hospital Course. — The patient was kept under observation from February 2 to February 27, during which time we were able to observe many of his typical attacks of arthritis. On February 5 he complained of tenderness in the left knee. This knee was painful on motion, but no erythema was present. The patella on the involved side was "floating" and could be easily ballotted. The next day the pain had disappeared, there was no limitation of motion and the patella was no longer ballottable. On February 7 the proximal interphalangeal joint of the left index finger suddenly became painful and swelled markedly, and there was limitation of motion. The skin above, and for a considerable area below, the joint was reddened and slightly edematous. Within twenty-four hours the redness and pain were entirely gone, but some swelling was still present. This symptom disappeared entirely within the next twelve hours. For the next few days the patient had mild pains of short duration, involving first the right knee, then the left elbow and finally the temporomandibular joint. On February 19 the proximal interphalangeal joint of the right index finger became swollen, red and painful, with considerable involvement of the para-articular structures. These symptoms disappeared within less than twenty-four hours. The patient had no further joint disability during the next eight days. On the last day of his hospitalization he had mild involvement of the left ankle. Throughout this time he had no medication or physical therapy. At first he was allowed to be up and about in the wards, but during the last week of his hospital stay we had him perform hard manual labor in the hospital kitchen. He had less joint trouble while working, although he thought that hard labor had seemed to precipate attacks before he entered the hospital.

The patient was readmitted October 26 for further study. He informed us that he had been free of symptoms since his previous discharge. He had been able to carry on hard manual labor and did not take any medicine. Physical examination gave entirely negative results. Roentgenograms and routine and special laboratory procedures showed nothing abnormal.

Summary and Conclusions

In none of the cases so far reported, including ours, were there any permanent joint changes that could be regarded as the result of the arthritic attacks. None of the patients had any elevation of the sedimentation rate or changes in the leukocyte count, and all were afebrile during and between attacks. The sudden appearance and disappearance of symptoms would suggest an allergic mechanism, but, thus far, this has not been proved. None of the patients who were observed over a considerable period have shown any evidence of endocarditis or have had any cardiac disturbances suggestive of rheumatic fever.

In the case reported by Paul and Logan,[6] it was felt that the attacks of rheumatism were related to the psychic upsets. The patient was extremely nervous and was sure that nervousness would usually precipitate an attack. In 3 of the more recently reported cases the patient was of neurotic temperament or, at least, maladjusted to his environment. These circumstances suggest that psychosomatic factors may be involved in the production of the lesions of palindromic rheumatism. Up to the present time only 39 cases have been reported, and to this series we have added another.

STUDIES ON NEUROMUSCULAR DYSFUNCTION

IV. Neostigmine Therapy of Acute and Chronic Cervical Intramuscular Fibrositis *

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and
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While neostigmine has been used extensively over a number of years as a parasympathetic stimulant, its use in neuromuscular dysfunction has been limited to the treatment of the relatively rare disease myasthenia gravis.[1] In this disease, neostigmine appears to correct a defect in transmission at the myoneural junction by facilitating the passage of motor nerve impulses across this junction.

In 1943, Kabat and Knapp[2] introduced the use of neostigmine in the treatment of poliomyelitis. The action of the drug in this disease is largely inhibitory, resulting in relaxation of muscle spasm and stretch reflexes and improvement in coordination. Inhibition of muscle spasm by neostigmine has now been reported in a number of common chronic conditions: spasm following fractures and other injuries,[3] rheumatoid arthritis,[4] hemiplegia,[3] cerebral palsy,[5] and subacromial bursitis. Confirmation of the effectiveness of neostigmine therapy in poliomyelitis has been reported.[6] While the mechanism of the inhibitory action of neostigmine on muscle spasm still requires clarification, the available evidence suggests an action directly on synapses in the central nervous system.[7]

Intramuscular fibrositis[8] of the cervical region (stiff neck) is an acute painful condition which frequently follows exposure to a draft of cool air. It is usually self limited and does not persist for a long period, although there are occasional chronic cases. Muscle spasm is the primary factor in the pain and limitation of motion, and since the muscle spasm does not serve any useful purpose (as, for example, splinting), relaxation of the muscles results in relief of the disability. In many instances, heat and massage fail to relieve this condition rapidly, and a quick effective treatment would be a significant addition to the therapeutic armamentarium of the physician.

Because of the effectiveness of neostigmine in relaxing muscle spasm in a variety of chronic conditions, neostigmine therapy was given a trial in 9 cases of acute cervical intramuscular fibrositis. Neostigmine[9] resulted in rapid relief of the disability in all cases. Sometimes one injection was all that was necessary to bring about complete relief within twenty-four hours.

* From the Division of Public Health Methods and the Hospital Division, United States Public Health Service.
The patients were observed at the United States Marine Hospitals at Norfolk, Va.; Baltimore, Md., and Stapleton, S. I., N. Y., through the cooperation of Assistant Surgeon General R. C. Williams, Medical Director W. F. Ossenfort, and the late Medical Director, W. S. Bean.

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3. Kabat, H.: Pub. Health Rep. 59:1635, 1944.
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7. Kremer, M.: Quart. J. Exper. Physiol. 31:337, 1942. Kabat, and Knapp.[2]
8. Cecil, R. L.: Textbook of Medicine, ed. 5, Philadelphia, W. B. Saunders Company, 1942.
9. The neostigmine was supplied through the courtesy of Hoffman-LaRoche, Inc.

CASE 1. — C., a female, had suffered from torticollis (intramuscular fibrositis) for six days. The head was held flexed and deviated to the right. Limitation of motion of the head was practically complete. The pain was intense and the patient had been unable to sleep. Intensive physical therapy, consisting of heat and massage, since the onset had failed to bring any relief. Neostigmine methylsulfate, 1 cc. of 1:2,000 solution (1 mg.), and atropine sulfate, 1/150 grain (0.43 mg.), were administered intramuscularly at 2 p. m. and again at 3:30 p. m. By 4 p. m. the patient had been asleep, was able to hold the head erect without pain and had less pain on rotation of the head. At this time she was able to rotate the head through the full range, although this caused a good deal of pain. Within twenty-four hours, with no further therapy, the condition disappeared completely. There was no recurrence.

CASE 2. — M., a girl, aged 17, awoke one morning with severe torticollis. During the day there was no improvement. At 5 p. m., neostigmine methylsulfate, 2 cc. of 1:2,000 solution (1 mg.), and atropine sulfate, 1/100 grain (0.65 mg.), were administered intramuscularly. By 7 p. m. the patient noted less pain and was able to hold the head erect but could not rotate or extend it. By the next morning the disability had entirely disappeared.

CASE 3. — J., a woman aged 47, had acute torticollis following exposure to a draft after a hot bath. After four days, because of the severe pain, limitation of motion and inability to sleep, she was admitted to the hospital. Heat, massage and sedation during three days of hospitalization resulted in only slight improvement. One hour after administration of neostigmine and atropine intramuscularly, there were a definite decrease in pain and increase in various motions of the head, although some pain and limitation of motion persisted. That night for the first time since the condition had appeared, she enjoyed a restful sleep and was able to turn about without discomfort. The next morning the pain was almost gone and the stiffness was considerably improved. Neostigmine was administered that morning and evening and resulted in complete disappearance of the disability.

CASES 4, 5, 6, 7, 8, 9. — Six other patients suffering from acute intramuscular fibrositis of the cervical region obtained complete and lasting relief within twenty-four to thirty-six hours after one or two injections of neostigmine and atropine. Heat and massage had failed to correct the disability in these cases.

One patient who had suffered from chronic intramuscular fibrositis of the neck for six years showed marked improvement from two weeks of neostigmine therapy.

CASE 10. — M., a man aged 58, had suffered from intramuscular fibrositis of the cervical musculature for six years. He had limitation of extension, lateral deviation and rotation of the head and complained of aching, muscle strain and discomfort in the neck. There had been no significant change in his condition during the six years, and physical therapy at various times had failed to bring about substantial improvement. Without the patient's being aware of the nature of the medication, a placebo (2 cc. saline solution subcutaneously) was administered daily for five days, with no subjective or objective improvement. Neostigmine methylsulfate, 2 cc. of 1:2,000 solution (1 mg.), and atropine sulfate, 1/100 grain (0.65 mg.), were then administered daily by subcutaneous injection for two weeks. At the end of this period the disability had almost entirely disappeared. There were full range of motion and almost complete relief from the subjective symptoms. The treatment was then discontinued. When the patient was examined one month later, there had been no recurrence of the disability.

Comment

Acute cervical intramuscular fibrositis is a self-limited condition, usually of short duration, and caution is therefore necessary in attributing recovery to any therapeutic procedure. This series of cases is too small to warrant definitive conclusions, and a controlled study will be necessary to establish the place of neostigmine in treatment of the condition. Nevertheless, the preliminary observations have been promising, and, should further investigation substantiate these findings, the drug may provide a simple and effective means of therapy for this common and distressing condition. It is worth noting, in addition, that the relaxation of muscle spasm in acute intramuscular fibrositis of the neck is in keeping with the observed therapeutic action of neostigmine in relief of muscle spasm in a variety of chronic conditions, including chronic cervical intramuscular fibrositis, as reported here in case 10.

Summary

1. In 9 cases of acute intramuscular fibrositis (stiff neck), neostigmine therapy was followed by rapid relief.

2. One patient with cervical intramuscular fibrositis of six years' duration showed marked improvement from neostigmine.

SUGGESTIONS TO IMPROVE THE EARLY TREATMENT OF HAND INJURIES *

Sterling Bunnell, M.D.

Civilian Consultant to the Secretary of War

From a survey of general hospitals in the zone of the interior most hands injured by gunshot wounds show considerable crippling which could have been prevented by early proper selection of treatment in the theater of operations and in the zone of communications. Commonest are stiffening of joints, faulty position of hand, excessive induration, and malunion of fractures. Most proximal finger joints are held straight and stiff and the wrist in the straight instead of dorsiflexed position. In some there is the position of flat palm with thumb at the side. Where possible a splinted hand should be in the "position of function." Brief directions for early treatment to guard against these prevalent conditions are offered.

Joints of the whole hand stiffen if all are included in the splint. Only the injured part should be splinted, the remaining digits being left free to move throughout their range. The thumb should be free distal to the thenar crease so it may come forward in opposition, and the fingers free distal to the distal flexion crease in the palm so their proximal joints can flex to a right angle. If proximal finger joints are held straight, they will stiffen so and then cannot flex, but if held flexed, they can extend and will remain flexible because in this position the collateral ligaments are taut and thus cannot shorten. Surgeons overseas and on hospital ships should see that uninjured digits are free to move and should compel patients to keep moving them to gain and maintain motion. A special detail to compel these ambulatory patients to keep their fingers moving is well worth while. The muscle and tendon action improves circulation, nutrition, and mobility of the hand and forearm. Stiffness in hand joints is readily prevented but is most difficult to cure.

Excessive induration, scar tissue formation, and flexion contracture result in a hand if wounds are allowed to remain open too long. As soon as granulations are clean, they should be closed over by a thin skin graft. Pedicle grafts are substituted later. Where flexion contractures are in evidence, corrective splinting will lessen the degree of contracture.

Much malunion is seen from the lack of traction in the first three or four weeks. The metacarpals and phalanges show overlapping and faulty rotation. The metacarpals buckle backward toward the dorsum of the hand and the proximal phalanges buckle volarward, both upsetting muscle balance from the point of angulation distally. In treating either of these fractures the plaster cast on the hand and forearm furnishes a foundation for the metal extension for the use of traction. This extension may be by a

* Reprinted Bull. U. S. Army Med. Dept. 88:78 (May) 1945.

padded duralumin strip or a long loop of soft wire drawn straight, incorporated in the plaster at palm and wrist, padded and extending beyond the flexed finger. It is curved so the proximal finger joints are in 45 degrees of flexion and the interphalangeal joints flexed still more. The finger, or fingers, lie along such a curved extension which in turn is held in place by

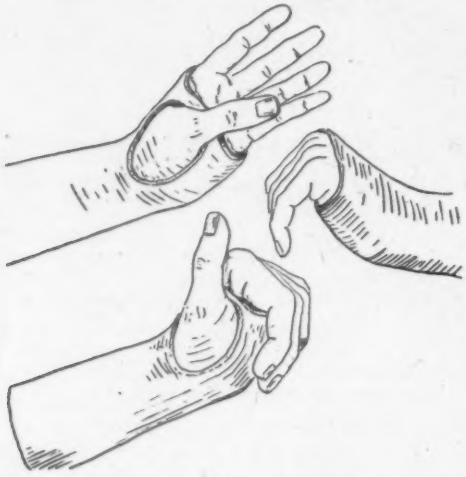

Fig. 1. — Correct way to apply a cast to hand and forearm. All fingers are free to move, because the cast does not extend farther than the distal flexion crease in the palm, and the thumb is free because the cast ends at the thenar crease. Wrist is in moderate dorsiflexion. Proximal finger joints can be flexed and the thumb opposed.

a cord extending from it to the forearm to maintain this flexion. Traction on the finger is by adhesive on skin if there is no displacement. Otherwise, pulp or skeletal traction is used from finger to extension apparatus. For either, a stiff piece of stainless steel wire or a fine Kirschner wire is used, bending each end down the finger to end ½ inch beyond the finger tip as a ring or hook to which is attached the traction cord. Special traction bows or steel safety pins may be used.

If pulp traction is used, the wire, pointed by clipping it obliquely, is thrust through the finger pulp from side to side. It should penetrate exactly at the spot marked in the diagram opposite the mid portion of the nail so as to avoid the sheath of the flexor tendon, the phalanx or the matrix of the nail. In skeletal traction a fine size of Kirschner wire is drilled laterally through the head of the proximal phalanx, avoiding the joint and lateral bands of the dorsal aponeurosis. This traction has the additional advantage of keeping the collateral ligaments of the proximal finger joint drawn out long. Unless they are of normal length, the joint will not be able to flex. The position of flexion of the joint also keeps these ligaments long for, if these joints should be allowed to remain in the position of extension, these ligaments would shorten in this position, thus making flexion impossible. The straight splint, flat splint, or a banjo splint should never be made. They throw the fractures out of alignment and stiffen the whole hand in malposition. Only for rare special purpose should a plaster cast ever extend beyond the distal flexion crease in the palm or the thenar crease or include all of the fingers to their ends. The wrist should be in 20 degrees of dorsiflexion and the plaster curved in the palm to preserve the transverse metacarpal arch.

If the peripheral nerves are injured, the hand will be drawn into position of deformity because of muscle imbalance, thus necessitating splinting to

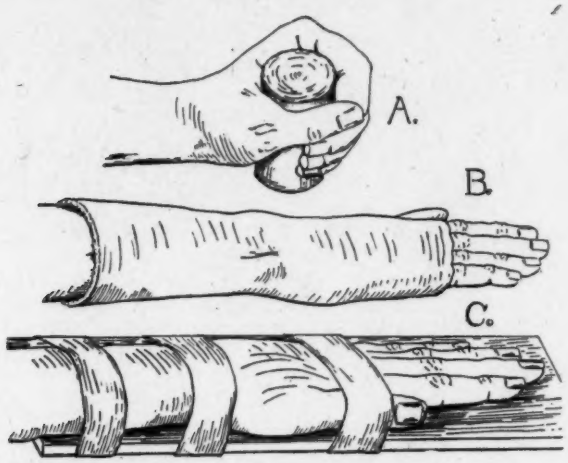

Fig. 2. — Three incorrect ways of splinting a hand, all of which contribute to crippling: *A*, bandaging all fingers over a roller bandage stiffens the hand as a whole and the joints of all fingers. Only the injured digit should be splinted and the others free to move and should be kept moving. *B*, a plaster cast should not be applied with the wrist and fingers straight and should never include uninjured fingers beyond the distal crease in the palm. Result: Proximal finger joints will be stiff and straight, and the whole hand and forearm unexercised. Wrist, arches, thumb, and fingers should be in position of function. *C*, strapping a hand to a board stiffens the whole member and in a position of nonfunction, namely, with wrist straight instead of dorsiflexed, palm flat with loss of metacarpal arch, thumb at side of hand instead of in opposition, and finger joints straight.

protect the paralyzed muscles from being overstretched and to correct the deformity. For radial palsy the wrist is held in 20 degrees of dorsiflexion, the proximal finger joints straight, and the carpometacarpal joint of the thumb in extension, preferably all by spring action. For median and ulnar nerve paralysis the clawing, flat-hand, and thumb at the side position are corrected by a small, light plaster of paris splint on the hand. The proximal finger joints are pushed into flexion, the metacarpal arch is curved by the palmar crossbar, and by pressing on the head of the first metacarpal the thumb is kept in opposition. For palsy of ulnar nerve alone, only when the deformity is becoming marked should a light plaster cast be worn to hold the proximal joints of the last two fingers in flexion.

Plan of Treatment in Theater of Operations

The wounded hand receives only a dressing and bandage in passing through the battalion collecting station and clearing station. At the evacuation hospital, the limb is cleansed with soap and water, and the wound is débrided. A thin layer of its damaged surface is excised and foreign bodies are removed under the ischemia of a blood pressure band so as to avoid cutting nerves, vessels, joint capsules, or tendons. The blood is first expressed from the limb by an elastic bandage if available. The wound may be irrigated with saline solution. Severed nerve ends in forearm are joined by one stitch of stainless steel wire to prevent retraction, and to wall out infection joint capsules are closed. The wounds are packed lightly with gauze. Never is a drain placed through and through. A pressure dressing with mechanic's waste is applied, placing the hand in the position of function and maintaining it so by a volar plaster splint applied outside the dressing—never by an uncut circular cast. Parenteral sulfonamide and penicillin are started.

Within four days to a week after injury, on arriving at a general hospital, the first reparative treatment is started. Here a plaster splint with traction is applied. Also, the wound is closed by skin grafting. Traction has so often

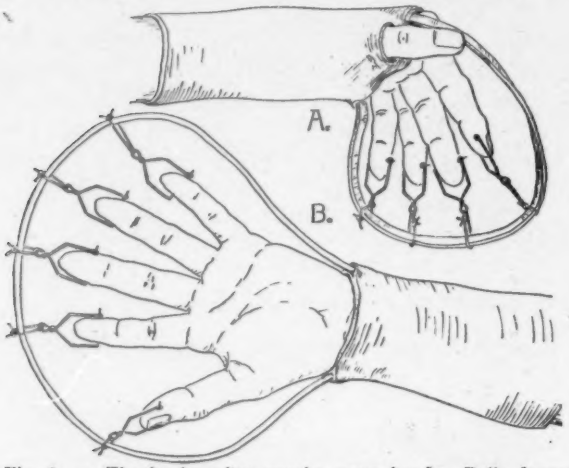

Fig. 3. — The banjo splint wrecks many hands. Pulls fingers in straight or wrong position which throws fractures out of line and stiffens all joints of digits. Fingers with traction should rest semiflexed on an extension support, as in figures 4 and 5. *A*, fingers in semiflexion should converge (see figure 5, *D*). Fingers are pulled straight and diverging. Thumb should not be inclosed in cast and wrist should be in dorsiflexion. *B*, digits are pulled in wrong or straight position and are not really splinted as hand flaps back and forth. Will result in stiffening and malunion.

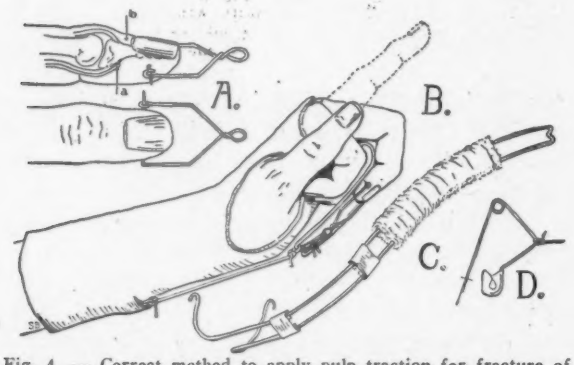

Fig. 4. — Correct method to apply pulp traction for fracture of phalanx or metacarpal: *A*, pin transfixes at correct site, avoiding matrix (upper arrow), nail, phalanx, and tendon sheath (lower arrow). *B*, plaster cast embraces hand and forearm, stops at distal crease in palm, leaving the uninjured fingers free to exercise throughout their range of motion and at thenar crease, giving thumb free motion of opposition. Finger whose phalanx or metacarpal is injured rests on padded wire extension (as in *C*) which is incorporated into plaster. A cord from wire to cast at forearm maintains the flexion. *C*, extension made of soft iron wire with two strips of tin and padding. A strip of duralumin may be used instead. *D*, method of using a steel safety pin for pulp traction. Point after transfixing is cut off.

been incorrectly applied both in placing the wire and in pulling at a wrong angle, resulting in much damage, that directions for its accomplishment should be studied. If the positions of fractured metacarpals and phalanges be corrected at this stage, much crippling will be prevented. If the traction is applied with the proximal finger joint in flexion, the collateral ligaments will remain elongated and later the joint will be able to move. If these ligaments are allowed to shorten, the proximal joints will become stiff and straight. Correct rotation of the bone may be ascertained by observing the plane of the finger nails and the plane of the motion of flexion of each of the fingers. The planes of motion should converge to the tubercle of the scaphoid. Attention to position of fractures saves the necessity in the reconstructive treatment of corrections by osteotomy. Early closure lessens induration and flexion contracture. All undamaged parts should move. Too long continued splinting stiffens hands. Most metacarpal fractures unite

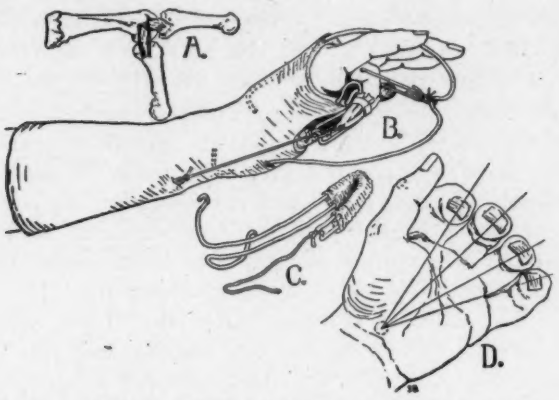

Fig. 5. — *A*, shows collateral ligaments of proximal finger joint tight in flexion but relaxed in extension. If this joint is splinted in extension these ligaments so shorten that the joint cannot be flexed. If splinted in flexion and with skeletal traction the joint remains limber. *B*, correct method of applying skeletal traction for fracture of metacarpal. Wrist in dorsiflexed 20 degrees and proximal finger joint flexed 45 degrees. Thin Kirschner wire transfixes neck of proximal phalanx and is bent, as shown for traction, to stiff wire extension loop from plaster cast. Finger is steadied by adhesive plaster on a wire extension (as in *C*) to maintain correct rotation. *D*, showing guides to correct rotation in setting fractures. In partial flexion, planes of finger nails form an arch. Planes of motion of the fingers converge to the tubercle of the scaphoid.

within a month. Maintaining the position of function—namely, wrist in dorsiflexion, proximal finger joints flexed and other finger joints slightly flexed, metacarpal arch curved, and thumb in opposition—together with persisting in active motion of all of the uninjured digits, will have months of disability. Special care should be used to keep the proximal finger joints in flexion and so to prevent stiffening.

READJUSTMENT TO PEACE — THE PEOPLE'S RESPONSIBILITY

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In a period during which a psychologically conscious public is nurturing an embryo interest in psychiatry, lay writers have been quick to recognize the popular appeal of a topic as kaleidoscopic as the psychiatric aspects of military service. Sensational discussions and diagnoses emphasizing the dramatic and extraordinary, coupled with startling statistics of millions of men discharged from the service for neuropsychiatric reasons, have eventuated in what I have chosen to call "mass psychiatric jitters." The psychologic effects of war have so colored the problem of "rehabilitation," which is foremost in the minds of the American people, that it has become something of an intellectual pastime to contemplate ways of facilitating the psychologic readjustment of our veterans to civilian life. Wives and mothers, with little or no discrimination, have begun to worry about the "personality changes" in returning veterans and about the subsequent emotional diffi-

culties which will be encountered. Wary employers have become skeptical about entrusting their equipment and the safety of their other employees to those who have experienced the mental ravages of war.

From the scientific viewpoint of psychiatry, such a general belief can only be ascribed to distorted values and misplaced emphasis. Many persons seem to have lost sight of the fact that some of the healthiest, most upstanding specimens of manhood and womanhood in our country went into our armed forces. Far removed from having been professional soldiers brought up by the grim teachings of war, they were young men and women, who, in their most formative years, knew nothing but the opportunity and happiness of a fruitful country at peace. Yet they have magnificently withstood the exigencies of war, and they are coming out on top! Need we be too fearful that they will find the readjustment to peace impossible.

In all probability, their military service will leave its mark; in view of the regimentation, discipline and hardships endured by those in military service, it can be assumed that they will return to us quite different from the people who went away. I, for one, am tremendously impressed by the fact that, as a result of their military experiences, they will have grown in mental stature; will be mature, hardheaded people who, resentful of being "rehabilitated," will take their readjustment problems into their own competent hands.

A principle which should direct all of our plans for rehabilitation is that all contacts with returning veterans should be highly individualized, governed primarily by everyday, solid, common sense. Any generalized solution to the problem is made infeasible by the manifold variations possessed by human beings in their physical and mental stamina and adaptability. The importance of the personalized contacts in the veteran's own community confers on every conscientious American not only the democratic responsibility but the moral obligation to tackle the problem intelligently, well informed on the actual state of affairs.

It cannot be denied that there are men whose emotional make-up is not suited to the restrictions of military existence; men who, because of emotional difficulties, are excused from service on a neuropsychiatric basis. However, to presuppose that all of this group, much less the veterans as a whole, will need psychiatric treatment, or even "special psychologic handling," not only is ridiculous but is dangerous thinking. Many men will return with physical and mental handicaps, but there will be an even larger number of borderline cases who may be toppled en masse in the wrong direction by overemphasis on psychiatric disorders and diseases.

There are so many contradictory statements appearing in the press and over the radio about mental casualties, neuropsychiatry and psychoneurosis that a state of general confusion exists in the public mind concerning the true meaning of the terms. In order not to create the very problem we are trying to avoid, we must straighten out public understanding of psychiatric terminology.

"Neuropsychiatry" is a term which embraces the entire field of nervous and mental disorders, from a severed nerve to the most profound "insanity." Consequently, the disturbances denoted by an "NP" discharge vary from the least serious to the most serious. The most serious—and the smallest percentage—are the psychotic, conditions which the laity call "insanity" and which require hospitalization. These authentic psychiatric disorders arising out of the war are a pressing problem and cannot be ignored; they will need the time and resources of trained psychiatrists. However, I am convinced that the problem has been magnified, and that with the return of

peace, we will see that the percentage of psychiatric casualties of war and those of civilian life are more nearly parallel than has been believed. Time will tell. At the moment, it is essential that we differentiate between the relatively small group of dischargees who require psychiatric treatment and the rest, who can readjust to civilian life without any special handling.

In the latter group are included the largest percentage of neuropsychiatric dischargees and rejectees, those classed as "psychoneurotic," a term which — though interpreted fantastically by some, morbidly by others and wrongly by most—usually means nothing more or less than that the individual cannot adapt himself to the military regimen. In relation to such men, the important factor, too often forgotten, disregarded or misunderstood, is that they had probably been making a successful adjustment prior to induction, and there is no reason why they should not do so after their discharge. There are now in society a goodly number of so-called psychoneurotics who are making an adequate adjustment, getting along perfectly well with their fellow men.

Human nature, a composite of multitudinous vagaries and peculiarities, finds allowances for its foibles in the elasticity of a free society. In the breadth and scope of our economic and social order, there is room for the "likes" and "dislikes" of the seclusive dreamer, the social extrovert, the sensitive soul, the youth hardly loose from his mother's apron strings, the mature man inured in set habits and ways of living and millions of others whose differences are equaled only by their number. Civilian life offers this heterogenous group opportunity for choice and change in job, social, domestic and sexual relationships—the four important factors in a man's emotional adjustment. On the other hand, the military pattern, even in its barest essentials, stripped of any hardships such as combat, freezes jobs beyond any possibility of selection, limits sexual and domestic life within narrow margins and sharply confines social and recreational relationships. An individual who cannot adjust to any one of these factors may react in a psychoneurotic manner and lose his job in the armed forces. However, his discharge has no bearing on his subsequent civilian readjustment. Common sense tells us that every man does not have the ability or the personality to fill every job, and the success of a great part of the "rehabilitation" plan rests on the community's intelligent understanding that a psychoneurotic discharge in most instances merely implies an unfitness for military duty.

Regarding emotional difficulties in general, there is no material difference between handling the psychologic problems of servicemen with amputations or other physical injuries and handling the problems of civilians who suffer accidents. The first cardinal principle to observe is that these men must not be made a "class apart." The despondency of the blind, the hopeless resignation of the legless or armless or the despair of the disfigured will not be alleviated by excessive sympathy or efforts "to make it easy" for them. Naturally, the disability should not be ignored, but neither should it be magnified. Following the expert medical treatment and specialized retraining provided by the government, these veterans will want to establish for themselves a place in society. Their success will depend greatly on communities which are willing to focus on what is left instead of what is gone, which accept them as productive independent citizens instead of as liabilities.

We must have sympathy, we must have understanding; but let that sympathy and understanding convey an affirmative point of view, wherein our affection and regard will show itself in the effort to save the veteran from the barren life of invalidism, dependency and charity. Countless men

and women who have overcome handicaps to lead economically independent and normal social lives have illustrated that the successful rehabilitation of the disabled hinges on their attaining independence and self reliance. An appreciation of these facts in the home and in the community will help to direct these men to the enjoyment of full, rich lives, for which there is no substitute.

Our obligation to those who served us so valiantly on battlefields in every corner of the earth cannot be fulfilled by pity, or sympathy, or kindness, or money. Rather, it will be met by returning to them what they have been dreaming of, planning for and fighting for—the heritage of their country, the right to assume their places as constructive citizens. Pensions, benefits and medical treatment can be provided by the government, but the real essence of rehabilitation is the people's democratic responsibility, a responsiblity which can be fulfilled in every nook and cranny of every community in the country.

There will be nothing about the returning veterans which will render them free from human traits. Having been out of touch with the old life for a long time, they may find that their interests are no longer those of the old crowd, if any of the old crowd are still around. From their hierarchial experience in the service, some may temporarily have lost their initiative; on the other hand, others may have become orderly, purposeful individuals eager to start on clearcut plans for the future. Some may be overly sensitive to noise, may seem irritable or domineering, but these are not psychiatric symptoms indicating minds crippled by the strains of war.

The vast majority of returning servicemen will need no psychiatric treatment, no "special handling." All they will need is a chance to get accustomed to "being back home again" and then an opportunity to direct their capabilities in essential, productive efforts in the social and economic order.

The initial step in the readjustment of veteran and civilian alike to peacetime pursuits will be the reintroduction of practical economic, social and psychologic drives of peacetime into our thinking. On our production team for war, the press, radio, moving pictures and other educational agencies are being utilized to direct our every thought and effort toward the ultimate defeat of the enemy. In the same way, with our whole people reeducated to the ways of peace, we can best achieve the peacetime goals. Plans for rehabilitation should be broad enough in scope and sound enough in principle to encompass all the people.

The demobilized war workers, especially, may have difficulties in establishing a stable position for themselves. This massive industrial group, without the benefit of military discipline, comprises a large number of people whose homes and social contacts have been seriously dislocated. Hired without the usual employment investigation and formalities, they have moved out of their accustomed habitats into war industrial centers, upsetting and unstabilizing their entire scheme of life. For practical reasons, any procedure aimed at facilitating the readjustment of the dischargees should be applied with equal or greater emphasis to the demobilized war workers.

Probably the greatest task in the coming readjustment will be to foster a feeling of "belonging," a feeling of being as essential to the peace as to the war.

In the final analysis, let us assume that the demobilized service men and women are healthy, normal resourceful young people, who are capable of sizing up the situation and making their own adjustment back into the community, if the community does not become too artificial and abnormal in its attitude toward these returning people.

A very small percentage of those returning from military service will need "special handling." In many instances, there will be a degree of restlessness, but for the most part, such symptoms tend to be self liquidating as the war experience recedes in point of time. We are not a nation of psychoneurotics. Neither has the war experience produced psychoneurotics and other neuropsychiatric conditions in great masses. To assume so might produce resentment and create the very situation we are professing to cure, provided there is anything in the power of suggestion!

WILHELM KONRAD ROENTGEN: AN ANNIVERSARY

HOWARD A. CARTER, B.S., Secretary

and

JOHN S. COULTER, M.D., Chairman

Council on Physical Medicine of the American Medical Association

CHICAGO

The announcement that the energy within the atom can be utilized in a bomb came fifty years after the discovery of the x-ray. Roentgen discovered x-rays when he was 50 years old. The hundredth anniversary of his birth coincides approximately with the anniversary of the beginning of the electrical era. The progress made in electrification, more specifically as it applies to diagnosis and therapy, is significant.

When Roentgen was born, March 27, 1845, horses furnished motive power for transportation overland. The incandescent lamp had not been thought of and the arc lamp was not to be used commercially for thirty-three years. There was no electric wiring in houses, electric street cars were undreamed of and, aside from the electric telegraph which Samuel Morse had succeeded in perfecting and putting into operation between Washington, D. C., and Baltimore, Md., the commercial exploitation of electricity was practically nil. Ampère, Volta and Faraday had reported their fundamental research and discoveries in electricity, and thus Roentgen grew up in an exciting period of rapid scientific expansion.

Fifty years ago, when Roentgen made his famous discovery, the city of Chicago reported that it had a grand total of 500 miles of trolley lines and that the benefit to transportation could hardly be overestimated, because "the speed of travel averaged nearly 8 miles per hour, or twice that of the horse-power lines." It is significant also that 1945 was selected as the semicentennial for the horseless carriage. Fifty years ago an experimental automobile was driven for 750 miles at a rate of nearly 16 miles an hour. Alexander Graham Bell had demonstrated several years before that a telephone was practical. Commercial electric power was about seventeen years old, and the investment in it was estimated at about one billion dollars. Many other electrical appliances had been introduced which are now commonplace.

In 1865 James Clerk-Maxwell proposed a theory based on the electrical and magnetic experiments of Faraday and Oersted that light traveled in waves and was electromagnetic in character and that a charge of electricity moving through space constituted an electrical current. Heinrich Hertz proved in 1888 by experiment that Clerk-Maxwell's assumptions were valid.

He demonstrated that radio energy moved through space with the same speed as that of light and behaved in much the same manner. He showed that radio energy had a wave characteristic and that the waves could be measured in lengths varying from a few inches to many miles. Hertz's equipment demonstrated that energy was transmitted at short distances. In this period Marconi began his experiments which culminated in wireless telegraphy.

Not until Sir Oliver Lodge demonstrated the importance of tuning the circuits to make them all resonant to a particular frequency did the wireless telegraph function successfully over long distances. With the aid of these improvements, Marconi, in 1901, was able to detect signals in Newfoundland sent out from Cornwall, England. D'Arsonval in 1896 experimented with high frequency energy and observed that tissues were heated without any electrical sensation. Thus, diathermy was a direct outcome of the aforementioned discoveries.

In 1895, while experimenting with a highly exhausted vacuum tube on the conduction of electricity through gases, Roentgen observed the fluorescence of a barium platinocyanide screen which happened to be lying near the tube. Further investigation showed that this radiation had other characteristics and also was capable of passing through many substances which are opaque to ordinary light. He also discovered that a photographic plate was affected even though covered by many thicknesses of paper. Later Roentgen demonstrated that a hand placed in the path of the rays cast a shadow on a fluorescent screen. He called the radiation "x-rays," because he was not absolutely sure of their nature. They behaved in several respects like rays of light, particularly in regard to reflection and refraction. But in other respects the radiation did not perform as light, and he formulated the hypothesis that it was a longitudinal vibration in the ether. It is interesting to note that thirty years ago, in 1915, H. A. J. Mosseley discovered that x-rays were refracted by a crystal which produced a spectrum. This effect was much like that of ordinary light being refracted from a surface containing thousands of ruled parallel scratches.

The work of Whitney and Coolidge on the incandescent lamp set the stage for improvement in x-ray tubes. Coolidge succeeded in producing wrought tungsten for the filament of an Edison incandescent lamp, and he turned its application to the improvement of x-ray tubes. He replaced the platinum target in the tubes with tungsten. Reasoning that the electronic emission depended on the temperature of the filament, he decided to control the temperature by a rheostat. Having controlled the electronic emission, he also controlled the output characteristics of the tube.

Roentgenology now became a more exact science. Today, one and two billion volt x-ray tubes generate x-rays which will penetrate the body tissues with ease. The rays not only are being used in the practice of medicine but have a wide application in industry, penetrating many inches of steel. For his outstanding work, Roentgen was given the Rumford medal of the Royal Society in 1896 and the Nobel Prize in 1901.

The possibility that x-rays might have therapeutic value occurred to J. E. Gilman, of Chicago, in January, 1896, when he observed a manufacturer of tubes who had a dermatitis of the hands caused by exposure to rays from the tubes.

In July, 1896, Despeignes, of Lyons, France, reported a treatment for carcinoma with x-rays. He noted that the patient was improved and the pain relieved. After this a host of investigators and experimenters tried the new rays for many different ailments.

So this fiftieth anniversary is interesting not only because of the discovery of x-rays, but because it marks the beginning of a great technical era. In view of past achievements, one is led to believe that progress in the next fifty years will be impressive.

In the field of physical medicine, considerable advance has been witnessed in the last twenty-five years. With the discovery of new agents there is every reason to believe that expansion and development will take place in the near future.

STOOL FOR LEG WHIRLPOOL BATHS *

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Medical Corps, Army of the United States

The use of a leg whirlpool bath presents the hazard of injury because of having to climb into the tub and because of the elevated position of the patient during therapy. The many types of stools and platforms in use make it apparent that an ideal type of stool has not yet been devised. The use of a board at the end of the tub was tried at this hospital, but it was

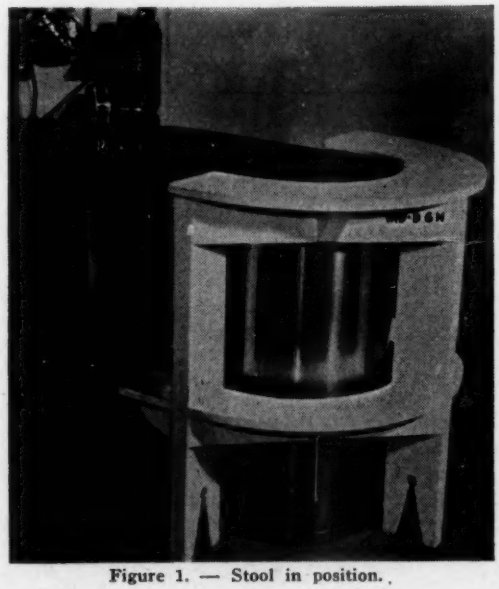

Figure 1. — Stool in position.

found uncomfortable, hazardous, and generally unsatisfactory. An ordinary high stool also is hazardous.

The stool described here can be constructed of scrap lumber. The support just beneath the inner arc of the top platform is recessed to fit the rolled

* Reprinted Bull. U. S. Army M. Dept. 87:120 (April) 1945.

top edge of the tub. When fitted exactly, it is impossible to tilt this stool, because it is immovable unless it is first pulled away from the tub. The edge of the inner arc of the top platform is rounded and fits over the edge of the tub; this presents the utmost in comfort and makes it impossible to pinch clothing or skin between stool and tub. This stool also permits full use of the bath.

The lower platform simplifies the hazardous procedure of climbing into

Figure 2. — Inside view of stool.

the tub and is also used as a support for the opposite leg and as a shelf for towels.

The demands of a heavy schedule have occasionally necessitated the use of the same bath by two patients. This stool permits of this doubling. Ordinarily the use of the same bath by two patients should be condemned.

In constructing this stool, the inner arc of the top platform should be recessed to fit the top rolled edge of the tub; the bottoms of the legs may require adjusting to conform to the grade of a concrete or tile floor. The stool must be constructed to encircle completely the end of the tub and must extend several inches along the sides of the tub. Measurements will vary with the type and construction of the various whirlpool baths.

ARCHIVES of PHYSICAL MEDICINE
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.·. EDITORIALS .·.

PHYSICAL MEDICINE AND RHEUMATOID ARTHRITIS

Thorough familiarity and understanding of the multiple clinical manifestations of rheumatoid arthritis and the various therapeutic possibilities is almost a necessity for any specialist in Physical Medicine. In the early and atypical cases many patients present interesting and difficult diagnostic problems as Ropes[1] described in the ARCHIVES one year ago. Often by careful observation of patients receiving physical therapy aid may be given the internist in reaching a diagnosis. This may be of considerable importance in cases of industrial accidents where there is a resultant low back pain and the differential diagnosis may be that of a ruptured intervertebral disc or rheumatoid arthritis or both. Paul and Carr[2] have reported a case of another interesting syndrome termed "palindromic rheumatism" which the keen observer may recognize among his arthritic patients. There is still another rather large group of patients familiar to the physical therapist frequently classified as having fibrositis. Unfortunately our knowledge of the pathogenesis or pathologic findings in this condition is extremely inadequate. The severity of the symptomatology, however, cannot be denied. Muscle spasm and pain may be severe, and focal points of exquisite tenderness may be palpated. It is among this group of patients that one hears of methods of treatment very varied in nature which seemingly are effective. Vitamin E, special technics employing deep massage, traction and manipulation, application of static electricity, and novocain injection, all have their proponents, with many case histories of satisfactory results. We now find that neostigmine has been used successfully, according to Kabat and Jones.[3] It is extremely difficult to evaluate the effects of any of these different types of therapy upon a condition about which we understand so little and whose course is so variable and prognosis often unpredictable. In the literature one tends to find only reports of successful treatment. There are certainly a large number of patients resistant to a large variety of treatments, some of whom may go on to develop definite rheumatoid arthritis. In the experience of the writer, this condition is frequently associated with emotional disturbances, so that it may well come under the realm of psychosomatic medicine. Certainly the enthusiasm and conviction of success in treatment may at times be principally responsible for therapeutic results.

The importance of a properly chosen and well-supervised program of physical therapy for patients with rheumatoid arthritis cannot be denied and should be considered an essential part of any adequate therapeutic regime in this disease. The important details in prescription and technic of physical therapy have been well described by Comroe.[4] The prevention of deformities of hands in arthritic patients present a difficult problem. Bearing in mind the principles of functional anatomy and making use of the proper

1. Ropes, M. W.: Differential Diagnosis of Rheumatoid Arthritis, Arch. Phys. Therapy 25:397 (July) 1944.
2. Paul, W. D., and Carr, T. L.: Palindromic Rheumatism, Arch. Phys. Medicine 26:687 (Nov.) 1945.
3. Kabat, H., and Jones, C. W.: Neostigmine Therapy of Acute and Chronic Cervical Intramuscular Fibrositis, Arch. Phys. Medicine 26:691 (Nov.) 1945
4. Comroe, H. I.: Physical Therapy in Rheumatoid Arthritis, Arch. Phys. Medicine 26:677 (Nov.) 1945.

types of splints as described by Bunnell[5] will make physical therapeutic measures more effective. Many patients may derive benefit from treatment in spas, and the description by Kovács[6] of those suitable for treatment of this group of patients will be found of value to the physician in choosing the correct location. The optimum management of rheumatoid arthritis presents a challenge to the physician and should bring out the best of his skill and art in the practice of medicine.

5. Bunnell, S.: Suggestions to Improve the Early Treatment of Hand Injuries, Arch. Phys. Medicine 26:693 (Nov.) 1945.

6. Kovács, R.: Spa Treatment of Rheumatic Diseases in the United States, Arch. Phys. Medicine 26:683 (Nov.) 1945.

ADVANCES IN ELECTRODIAGNOSIS

The frequent occurrence of peripheral nerve injuries among war casualties has precipitated a new interest in electrical testing. Appraisal of excitability of nerve and muscle by stimulation with appropriate electrical currents has been the chief diagnostic function of specialists in physical medicine. Among the methods used for this purpose the average physician or surgeon has been cognizant only of the reaction of degeneration as described by Erb. With the development of electrical engineering there have recently become available for experimental and occasional clinical use new instruments capable of producing currents of easily measured strength, duration, and frequency of impulse. The anticipated results of this technicologic development would be more accurate clinical methods for determining the degree of nerve injury and the early detection of regeneration. A number of laboratory and clinical studies on this subject have been published in the last few years which are of interest.

In view of the widespread familiarity with the reaction of degeneration, its fundamental features have been re-investigated by Pollock and his coworkers,[1] making use of new instruments. They found that, with certain exceptions, Erb's original description could be said to be accurate, at least for ordinary clinical purposes. When a muscle is denervated it no longer responds to a faradic current or similar tetanizing current with impulses of short duration. This is not absolutely true, however, as under anesthesia with sufficient voltage even denervated muscles will respond to faradic current. Erb further mentions that in denervation the anode closing contracture was equal to or greater than the cathode closing contracture. Pollock found that the anode and cathode contractions were frequently equal but never noted a true reversal. They felt that a more important characteristic of degenerative reaction was hyper-irritability to direct current stimulation, together with sluggish relaxation commonly described as a slow, wave-like contraction of the muscle. They felt this represented an actual tetanic contraction and found that this type of contraction in denervated muscles was obtained by currents of minimal amperage. Doupe[2] studied the nature of the sluggish contraction of denervated muscle by means of simultaneous mechanical and action potential recordings. He found that the sustained contraction observed on stimulation with a continuous direct current was due to repetitive excitation. Doupe also found that the temperature of denervated muscle was below normal and that the slowness of contraction could be partially explained on this basis, as the prolonged excitation factor

1. Pollock, L. J.; Goldseth, J. G.; Arieff, A. J.; Sherman, I. C., Schiller, M. A., and Tigay, E. L.: Reaction of Degeneration in Electrodiagnosis of Experimental Peripheral Nerve Lesions, War Med. 7:376 (May) 1945.

2. Doupe, J.: The Contractility and Excitability of Denervated Muscle, J. Neurol & Psychiat. 6: 141 (Oct.) 1943.

was also accentuated by cold, together with a hyper-irritability to currents of long duration at threshold strength.

Other attempts have been made to study more quantitatively electrical excitability in nerve and muscle by using currents of measured strength and duration. The muscle chronaxie has been advocated as an index of excitability but has not generally met the objection of its arbitrary definition and the difficulty of getting comparable results in different laboratories or clinics with slightly different technics and the unreliability of a single measurement to indicate excitability which is dependent on several variables. The determination of multiple points on the curve of strength duration relation by means of condensor discharges or more recently electronically produced square wave impulses has been found to be of more clinical value in the early detection of regeneration following spontaneous recovery or after nerve suture.[3-4] At times the presence of beginning innervation is made manifest by the appearance of a break or change in the slope of the strength duration curve.[5] This certainly occurs, but is not an altogether reliable sign, as variations in size, shape, and position of electrodes also affect the slope of these curves, and the detection of a minimal response is open to considerable error, particularly with percutaneous stimulation in an edematous extremity.

It is known that normally innervated muscles can accommodate to currents of slowly rising potential. The denervated muscle, however, is relatively hyper-irritable to these progressive currents of long duration, as it loses its power of accommodation. Pollock, et al.[6] have used such currents for diagnostic purposes and have shown that beginning regeneration can be detected by an increase in the threshold to currents of long duration. Still other measures of excitability have been made by using sinusoidal currents of very low as well as high frequency.[7-8] In this instance the current gradient, the duration, and the strength are all variable, although only the strength and frequency are measured. The type of muscle response to stimulation with frequencies below fifteen per second is entirely different from those of greater frequency so that there is the further difficulty of fixing a satisfactory end point in accurate quantitative studies. As would be expected, the optimum frequency changes with the state of innervation, and generators capable of producing such variable frequencies are of value in both treatment and diagnosis.

It can be seen from these brief annotations from the current literature that electrical testing appears to be increasingly complex in its technical aspects and accurate interpretation of results requires a high degree of skill and experience.

Some of the ambiguities of electrical diagnosis have been clarified by developments in electromyography. Denervated muscles are known to fibrillate and to discharge minute electrical potentials detectable only with the most sensitive recorders. The type of potentials discharged from resting, partially denervated muscles are quite different and their appearance is a helpful diagnostic sign. It has also been shown that perhaps the first sign of regeneration can be demonstrated by the appearance of motor-unit discharges

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4. Ritchie, A. E.: The Electrical Diagnosis of Peripheral Nerve Injuries, Brain 67:314 (Dec.) 1944.

5. Pollock, L. J.; Golseth, J. G., and Arieff, A. J.: The Use of Discontinuity of Strength Duration Curves in Muscle in Diagnosis of Peripheral Nerve Lesions, Surg., Gynec. & Obst. 79:133 (Aug.) 1944.

6. Pollock, L. J.; Golseth, J. G.; Arieff, A. J., and Mayfield, F.: Electrodiagnosis by Means of Progressive Currents of Long Duration, Surg., Gynec. & Obst. 81:193 (Aug.) 1945.

7. Grodins, F. S.; Osborne, S. L.; Johnson, F. R., and Ivy, A. C.: Stimulation of Denervated Skeletal Muscle with Alternating Current, Am. J. Physiol. 142:216 (Sept.) 1944.

8. Pollock, L. J.; Golseth, J. G., and Arieff, A. J.: Strength Frequency Curves in Electrodiagnosis of Experimentally Produced Peripheral Nerve Lesions in the Cat, Surg., Gynec. & Obst. 80:235 (March) 1945.

top edge of the tub. When fitted exactly, it is impossible to tilt this stool, because it is immovable unless it is first pulled away from the tub. The edge of the inner arc of the top platform is rounded and fits over the edge of the tub; this presents the utmost in comfort and makes it impossible to pinch clothing or skin between stool and tub. This stool also permits full use of the bath.

The lower platform simplifies the hazardous procedure of climbing into

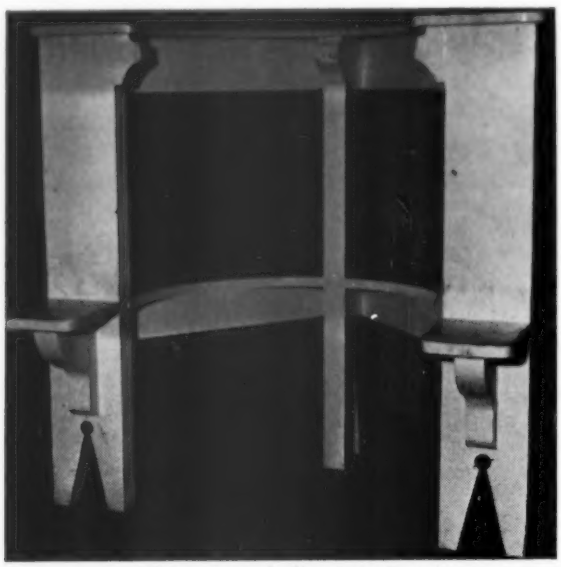

Figure 2. — Inside view of stool.

the tub and is also used as a support for the opposite leg and as a shelf for towels.

The demands of a heavy schedule have occasionally necessitated the use of the same bath by two patients. This stool permits of this doubling. Ordinarily the use of the same bath by two patients should be condemned.

In constructing this stool, the inner arc of the top platform should be recessed to fit the top rolled edge of the tub; the bottoms of the legs may require adjusting to conform to the grade of a concrete or tile floor. The stool must be constructed to encircle completely the end of the tub and must extend several inches along the sides of the tub. Measurements will vary with the type and construction of the various whirlpool baths.

ARCHIVES of PHYSICAL MEDICINE
OFFICIAL PUBLICATION AMERICAN CONGRESS OF PHYSICAL MEDICINE

EDITORIALS

PHYSICAL MEDICINE AND RHEUMATOID ARTHRITIS

Thorough familiarity and understanding of the multiple clinical manifestations of rheumatoid arthritis and the various therapeutic possibilities is almost a necessity for any specialist in Physical Medicine. In the early and atypical cases many patients present interesting and difficult diagnostic problems as Ropes[1] described in the ARCHIVES one year ago. Often by careful observation of patients receiving physical therapy aid may be given the internist in reaching a diagnosis. This may be of considerable importance in cases of industrial accidents where there is a resultant low back pain and the differential diagnosis may be that of a ruptured intervertebral disc or rheumatoid arthritis or both. Paul and Carr[2] have reported a case of another interesting syndrome termed "palindromic rheumatism" which the keen observer may recognize among his arthritic patients. There is still another rather large group of patients familiar to the physical therapist frequently classified as having fibrositis. Unfortunately our knowledge of the pathogenesis or pathologic findings in this condition is extremely inadequate. The severity of the symptomatology, however, cannot be denied. Muscle spasm and pain may be severe, and focal points of exquisite tenderness may be palpated. It is among this group of patients that one hears of methods of treatment very varied in nature which seemingly are effective. Vitamin E, special technics employing deep massage, traction and manipulation, application of static electricity, and novocain injection, all have their proponents, with many case histories of satisfactory results. We now find that neostigmine has been used successfully, according to Kabat and Jones.[3] It is extremely difficult to evaluate the effects of any of these different types of therapy upon a condition about which we understand so little and whose course is so variable and prognosis often unpredictable. In the literature one tends to find only reports of successful treatment. There are certainly a large number of patients resistant to a large variety of treatments, some of whom may go on to develop definite rheumatoid arthritis. In the experience of the writer, this condition is frequently associated with emotional disturbances, so that it may well come under the realm of psychosomatic medicine. Certainly the enthusiasm and conviction of success in treatment may at times be principally responsible for therapeutic results.

The importance of a properly chosen and well-supervised program of physical therapy for patients with rheumatoid arthritis cannot be denied and should be considered an essential part of any adequate therapeutic regime in this disease. The important details in prescription and technic of physical therapy have been well described by Comroe.[4] The prevention of deformities of hands in arthritic patients present a difficult problem. Bearing in mind the principles of functional anatomy and making use of the proper

1. Ropes, M. W.: Differential Diagnosis of Rheumatoid Arthritis, Arch. Phys. Therapy 25:397 (July) 1944.
2. Paul, W. D., and Carr, T. L.: Palindromic Rheumatism, Arch. Phys. Medicine 26:687 (Nov.) 1945.
3. Kabat, H., and Jones, C. W.: Neostigmine Therapy of Acute and Chronic Cervical Intramuscular Fibrositis, Arch. Phys. Medicine 26:691 (Nov.) 1945
4. Comroe, H. I.: Physical Therapy in Rheumatoid Arthritis, Arch. Phys. Medicine 26:677 (Nov.) 1945.

types of splints as described by Bunnell[5] will make physical therapeutic measures more effective. Many patients may derive benefit from treatment in spas, and the description by Kovács[6] of those suitable for treatment of this group of patients will be found of value to the physician in choosing the correct location. The optimum management of rheumatoid arthritis presents a challenge to the physician and should bring out the best of his skill and art in the practice of medicine.

5. Bunnell, S.: Suggestions to Improve the Early Treatment of Hand Injuries, Arch. Phys. Medicine 26:693 (Nov.) 1945.

6. Kovács, R.: Spa Treatment of Rheumatic Diseases in the United States, Arch. Phys. Medicine 26:683 (Nov.) 1945.

ADVANCES IN ELECTRODIAGNOSIS

The frequent occurrence of peripheral nerve injuries among war casualties has precipitated a new interest in electrical testing. Appraisal of excitability of nerve and muscle by stimulation with appropriate electrical currents has been the chief diagnostic function of specialists in physical medicine. Among the methods used for this purpose the average physician or surgeon has been cognizant only of the reaction of degeneration as described by Erb. With the development of electrical engineering there have recently become available for experimental and occasional clinical use new instruments capable of producing currents of easily measured strength, duration, and frequency of impulse. The anticipated results of this technicologic development would be more accurate clinical methods for determining the degree of nerve injury and the early detection of regeneration. A number of laboratory and clinical studies on this subject have been published in the last few years which are of interest.

In view of the widespread familiarity with the reaction of degeneration, its fundamental features have been re-investigated by Pollock and his coworkers,[1] making use of new instruments. They found that, with certain exceptions, Erb's original description could be said to be accurate, at least for ordinary clinical purposes. When a muscle is denervated it no longer responds to a faradic current or similar tetanizing current with impulses of short duration. This is not absolutely true, however, as under anesthesia with sufficient voltage even denervated muscles will respond to faradic current. Erb further mentions that in denervation the anode closing contracture was equal to or greater than the cathode closing contracture. Pollock found that the anode and cathode contractions were frequently equal but never noted a true reversal. They felt that a more important characteristic of degenerative reaction was hyper-irritability to direct current stimulation, together with sluggish relaxation commonly described as a slow, wave-like contraction of the muscle. They felt this represented an actual tetanic contraction and found that this type of contraction in denervated muscles was obtained by currents of minimal amperage. Doupe[2] studied the nature of the sluggish contraction of denervated muscle by means of simultaneous mechanical and action potential recordings. He found that the sustained contraction observed on stimulation with a continuous direct current was due to repetitive excitation. Doupe also found that the temperature of denervated muscle was below normal and that the slowness of contraction could be partially explained on this basis, as the prolonged excitation factor

1. Pollock, L. J.; Goldseth, J. G.; Arieff, A. J.; Sherman, I. C., Schiller, M. A., and Tigay, E. L.: Reaction of Degeneration in Electrodiagnosis of Experimental Peripheral Nerve Lesions, War Med. 7:275 (May) 1945.

2. Doupe, J.: The Contractility and Excitability of Denervated Muscle, J. Neurol & Psychiat. 6: 141 (Oct.) 1943.

was also accentuated by cold, together with a hyper-irritability to currents of long duration at threshold strength.

Other attempts have been made to study more quantitatively electrical excitability in nerve and muscle by using currents of measured strength and duration. The muscle chronaxie has been advocated as an index of excitability but has not generally met the objection of its arbitrary definition and the difficulty of getting comparable results in different laboratories or clinics with slightly different technics and the unreliability of a single measurement to indicate excitability which is dependent on several variables. The determination of multiple points on the curve of strength duration relation by means of condensor discharges or more recently electronically produced square wave impulses has been found to be of more clinical value in the early detection of regeneration following spontaneous recovery or after nerve suture.[3-4] At times the presence of beginning innervation is made manifest by the appearance of a break or change in the slope of the strength duration curve.[5] This certainly occurs, but is not an altogether reliable sign, as variations in size, shape, and position of electrodes also affect the slope of these curves, and the detection of a minimal response is open to considerable error, particularly with percutaneous stimulation in an edematous extremity.

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6. Pollock, L. J.; Golseth, J. G.; Arieff, A. J., and Mayfield, F.: Electrodiagnosis by Means of Progressive Currents of Long Duration, Surg., Gynec. & Obst. **81**:192 (Aug.) 1945.

7. Grodins, F. S.; Osborne, S. L.; Johnson, F. R., and Ivy, A. C.: Stimulation of Denervated Skeletal Muscle with Alternating Current, Am. J. Physiol. **142**:216 (Sept.) 1944.

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recorded by electromyographical methods before there is any change in electrical tests or clinical signs of function.[9-10]

9. Watkins, A. L.: Electrical Aids in Diagnosis and Prognosis of Nerve Injuries, Arch. Phys. Therapy 23:76 (Feb.) 1942.
10. Weddell, G.: Electromyography in Clinical Medicine, Proc. Roy. Soc. Med. 36:514 (Aug.) 1943.

WAR COURSES IN PHYSICAL MEDICINE

Special recognition should be given to the section on Physical Medicine at the Mayo Clinic for its splendid record of training 136 medical officers and 436 physical therapists during the war.* These courses were set up in January, 1942 at the request of the offices of the Surgeon General of the Army and the Bureau of Medicine and Surgery of the Navy as well as the office of the Medical Director of the Veterans Administration and the Canadian Veterans Administration. All Navy officers were assigned for a period of six months, and all Army officers and Veterans Administration physicians were assigned for a period of three months. Everyone of the 135 military physicians who completed this course spent one week at the University of Minnesota in Minneapolis through the cooperation of Dr. Miland E. Knapp and one week at Northwestern University in Chicago under Dr. John S. Coulter, receiving additional instruction in Physical Medicine at these two centers. The training of these men is a noteworthy war contribution, as many of these physicians have done outstanding work in the Army, Navy and Veterans Administration hospitals throughout the world and have substantially raised the standards of military Physical Medicine. The Congress on Physical Medicine welcomes these men into the ranks of those interested in Physical Medicine and extends its contgratulations to Dr. Krusen, Dr. Elkins and other members of their staff.

* See pp. 710, 711, this issue.

MEDICAL NEWS

Dr. Hollender and Other Congress Members Advanced

Dr. A. R. Hollender, formerly Executive Director of the Congress has been advanced to the rank of professor of otolaryngology at the University of Illinois College of Medicine.

Louis B. Newman is now full Commander, and is Head of the Department of Physical Medicine, U. S. Naval Hospital, Seattle, Washington.

Harry T. Zankel writes that he is now a Major. Major Zankel is chief of the departments of Physical Therapy and Occupational Therapy, La Garde General Hospital, New Orleans, La.

Dr. Albert T. Steegmann has been advanced to associate professor in psychiatry at the University of Kansas School of Medicine.

Dr. Kovács on Lecture Program

Dr. Richard Kovács participated November 1 to 3 in a refresher course presented by the Medical College of the State of South Carolina.

Physical Medicine at Pennsylvania

With the establishment of a Center for Instruction and Research in Physical Medicine at the University of Pennsylvania under the supervision of the Graduate School of Medicine, a complete course of instruction in Physical Medicine is now offered to qualified physicians desirous of specializing in this branch of therapeutics.

This course includes a review of the basic sciences which are essential if the clinical application of physical methods of treatment is to rest on a solid foundation. The close association of the Center with the various scientific departments of the University provides unusual opportunity for the study of this aspect of the subject. Instruction, both didactic and practical, in the various technics of physical medicine centers about the well equipped departments of Physical Medicine of the University and Graduate Hospitals. Teaching is conducted by the staffs of these departments in conjunction with certain members of the faculty of the medical schools of the University. Adequate facilities also have been made available for clinical instruction in those branches of medicine and surgery most concerned with physical therapy. The hospitals of the University of Pennsylvania, together with several adjacent medical institutions, provide a wealth of clinical material, both in-patient and out-patient, which not only affords student physicians unusual opportunities for case study but also provides them with a chance to obtain experience and individual training in the various procedures included under physical medicine. Excellent facilities are available for the study of poliomyelitis and its modern management at the Children's Hospital and the Philadelphia Hospital for Contagious Diseases. The close cooperation which has been established between the Department of Physical Medicine and the clinical divisions of the University's hospitals, notably those devoted to orthopedics, neurology, pediatrics, peripheral vascular diseases and rheumatic affections, furnishes a unique opportunity for student-physicians to learn at first-hand the practical application of physical therapy and its value in various fields of clinical medicine. The laboratories of the University, especially those of radiology, anatomy, physiology and neuro-physics, with their exceptionally complete equipment, affords training in the experimental approach to the many fundamental problems that await solution in the field of Physical Medicine.

Army Terminates Courses

With the change of requirements for Physical Therapists subsequent to V-J Day, it has been directed by the War Department that Physical Therapy training courses conducted by the Medical Department of the Army will be terminated with the completion of those courses now in progress. This means that assignments to the positions of student and apprentice Physical Therapist from Civil Service Registers are no longer authorized.

Report of the Council on Physical Medicine

According to the report of the Council, not all of the electrical energy from diathermy apparatus is absorbed by the tissues undergoing treatment; some of the high frequency energy escapes and is radiated into space, and this energy will in some instances unknown to the physician interfere with radio communication. The Council has cooperated with the Federal Communications Commission in an effort to solve this problem. The commission expects that all diathermy equipment manufactured henceforth will maintain the frequency within the limits prescribed.

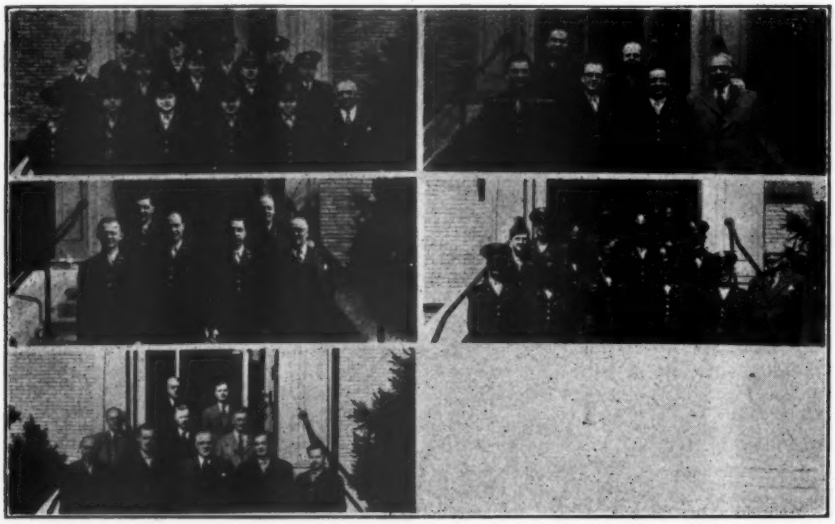
In matters pertaining to the education of physical therapy technicians the Council has cooperated with the Council on Medical Education and Hospitals, the American Registry of Physical Therapy Technicians of the American Congress of Physical Medicine and the American Physiotherapy Association. The Council also announces the preparation of slides which may be borrowed for instructional purposes.

With reference to artificial respiration and resuscitation, the Council has cooperated with the American Red Cross in educational activities promoting the manual method of artificial respiration.

MAYO CLINIC, SECTION ON PHYSICAL MEDICINE EMERGENCY COURSES FOR MILITARY PHYSICIANS

1942 1943

1944 1945



NAMES OF MEN IN THE PHYSICAL MEDICINE EMERGENCY COURSES AT THE MAYO CLINIC

January to March, 1942.

Top row, left to right: Lt. Dean M. Hayes, Lt. D. W. McCormick, Lt. A. O. Loiselle, Lt. Al Cherry, Capt. J. R. Stone.
Bottom row: Lt. W. M. Tipton, Lt. A. M. Pruce, Capt. J. J. DelVecchio, Lt. N. L. Cardey.

April to June, 1942.

Capt. R. C. Hume, Capt. W. R. Crane, Dr. Frank H. Krusen, Lt. G. M. Perisho, Capt. Gerald Shortz.

July to September, 1942.

Top row: Lt. Joseph G. Palin, Capt. Victor L. Pellicano, Capt. John E. Naugle, Capt. Walter J. Lee.
Bottom row: Capt. Earl W. Rothermel, Dr. Frank H. Krusen, Capt. Arthur P. Martini.

October to December, 1942.

Front row: Lt. C. P. Jensen, U. S. N.; Lt. E. H. Fralick, U. S. N.; Lt. L. A. Koontz, U. S. N.
Second row: Major M. Sones, U. S. A.; Lt. G. E. Drewyer, U. S. N.; Dr. Frank H. Krusen; Lt. Commander R. E. Kinneman, U. S. N.; Capt. S. E. Horwitz, U. S. A.
Back row: Major C. S. Nelson, U. S. A.; Lt. F. Geiger, U. S. A.; Capt. A. S. Stevenson, U. S. A.; Major I. C. Smith, U. S. A.; Lt. H. G. Rotman.

January to March, 1943.

Bottom row: Lt. Commander F. Becker, Lt. Commander F. A. Lowe, Lt. R. D. Chamberlain, Lt. H. S. Etter, Lt. H. Dinken.
Second row: Lt. R. J. Graham, Major L. A. Goldstein, Capt. A. R. Templeton, Lt. D. J. Scuccimarra, Lt. S. R. Coleman.

January to March, 1943.

Third row: Dr. Frank H. Krusen, Lt. H. A. Bradley, Lt. H. Rudolph, Capt. C. J. Doyle.
Back row: Capt. P. H. Dube, Capt. B. L. Boynton, Lt. W. P. Stephens.

April to June, 1943.

Bottom row: Capt. A. B. Pensler, Lt. E. W. Lowman, Lt. V. V. Rockey, Lt. J. G. Gershman, Lt. P. L. Wolpert.
Second row: Lt. L. J. Kopf, Lt. E. K. Stucky, Lt. F. S. Marshal, Lt. D. A. DePinto.
Third row: Dr. Frank H. Krusen, Capt. P. R. Stewart, Lt. G. G. Gill, Capt. T. E. Dredge, Capt. C. A. Shepard.

July to September, 1943.

Bottom row: Lt. George A. McCartney, Major Bernard J. Mintz, Major Charles W. Bankert, Dr. Frank H. Krusen, Dr. Earl C. Elkins, Capt. Louis N. Rudin, Capt. Carl E. Bosshardt.
Second row: Lt. Commander Edward L. Alexander, Capt. Cyrus E. Davis, Lt. Bert A. Treister, Capt. James T. Stephens, Capt. Joseph H. Boland, Lt. William J. Sullivan.
Third row: Dr. Morris Rubinstein, Dr. James S. Glotfelty, Dr. Morton Hoberman, Dr. John H. Kuitert, Dr. Crest J. Parrillo, Dr. Herbert Y. Glicksman.
Fourth row: Dr. Everill W. Fowlks, Dr. Leon S. Diamond, Dr. A. B. C. Knudson, Dr. James R. Deagen, Dr. Harry J. Haynes, Dr. Louis C. Jensen.

October to December, 1943.*

Bottom row: Dr. Earl C. Elkins, Dr. Frank H. Krusen.
Second row: Lt. Karl Keller, Capt. Milton N. Neibrief, Capt. Joseph Selsman.
Back row: Commander Harold J. Chapman, Capt. Charles Bush, Capt. Klenner F. Sharp, Capt. Murray Ferderber.

January to March, 1944.

Bottom row: Capt. J. L. Rothfeder, Major E. Z. Eperjessy, Major G. D. Wilson, Lt. D. H. Manning, Capt. S. R. Brown, Dr. Frank H. Krusen.
Second row: Lt. F. C. Ryan, Capt. R. W. Provenzano, Capt. A. O. Singleton, Capt. J. B. Cosgrove, Lt. W. E. Harris.
Back row: Capt. H. H. Buckelew, Capt. R. L. Sweet, Capt. M. R. Marshall, Lt. W. P. Scott.

April to June, 1944.

Front row: Capt. Norman A. Gerlich, Lt. Olin Bray, Lt. Wm. T. Kirchbaum, Dr. Frank H. Krusen.
Back row: Lt. Joseph Martella, Capt. Wilfrid H. Ferguson.

October to December, 1944.

Front row: Capt. Chas. H. Porter, Maj. H. Schiff, Dr. Frank H. Krusen, Capt. W. P. Levis, Maj. Jos. A. Kwint.
Second row: Dr. G. A. Lawson, Dr. M. D. Graham, Dr. M. C. Adamson.
Third row: Dr. A. T. Leatherbarrow, Dr. C. H. C. Bell.

January to March, 1945.

Bottom row: Capt. Wm. J. McAuliff, Capt. Charles Bushold, Capt. Merle J. Denker, Dr. Frank H. Krusen.
Back row: Lt. Charlton P. Armstrong, Capt. Marion F. Stormont.

April to June, 1945.

Front row: Lt. Jay L. Sittlery, Capt. Samuel Spencer, Capt. Emil Gutman, Capt. Harold G. O'Donnell, Capt. Harry H. Samberg, Dr. Frank H. Krusen.
Second row: Lt. Everett F. Donnelly, Capt. Frederick E. Dugdale, Capt. Wm. E. Steiner, Capt. Allen S. Russek.
Back row: Capt. Saul Machover, Capt. David A. Roberts, Capt. W. W. Walton.

* Capt. Henry Farris who was a member of this class is not in this picture. With him there are 136 names.

Meeting of Technicians in Manila

On Aug. 5, 1945, twenty-two physical therapists gathered in the physical therapy department of the 49th General Hospital, Manila, to plan and organize the physical therapy association of the Southwest Pacific. Talks were given by Lieut. Col. Darell Overpeck, AFWESPAC Orthopedic Consultant and Lieut. Col. Harold Sofield, AFWESPAC Reconditioning Consultant.

Helen Kaiser Sent to Greece

The division of physical therapy at Duke Hospital has granted leave of absence to its technical director, Miss Helen Kaiser, to spend several months in Greece in the establishment of a physical therapy school at the University of Athens.

The Greek division of physical therapy plans to send two special students to Duke Hospital next year for further training. They will be given scholarships, and the Greek residents of Durham have offered to provide food and housing for them. Text books and equipment for the physical therapy project will be sent to Greece from America.

Educational Films

Professionally prepared sound films which have been completed by experts in the U. S. Office of Education and which are of interest to those who are teaching physical therapy are available as follows:

OE 175, The Electron, 16 minutes.
OE 408, Therapeutic Uses of Heat and Cold, Part I, Administering Hot Applications, 21 minutes.
OE 409, Therapeutic Uses of Heat and Cold, Part II, Administering Cold Applications, 22 minutes.
OE 410, Hydrotherapy, 22 minutes.
OE 176, The Diode, 17 minutes.
OE 414, Fundamentals of Massage, 12 minutes.
OE 415, Recreational and Occupational Therapy.
OE 422, Teaching Crutch Walking, 13 minutes.

The films may be purchased or rented and all information may be obtained from Castle Films, Incorporated, which distributes these films for the United States Office of Education.

Refresher Courses for Physicians

Refresher and special postgraduate training for physicians and surgeons returning to civil practice from the armed services is under way at the University of Illinois College of Medicine.

The first one-week to three-month refresher courses for specialists already has been offered. The first three-month refresher course for general practitioners started Nov. 1. Forty-six residencies for long-term specialist training and a number of research fellowships have been awarded.

The program is financed with the aid of a $90,000 three-year grant from the W. K. Kellogg Foundation.

New students can start the work at the beginning of any month. Enrollment is limited to 40 at one time. Veterans will be given preference in enrollment, but civilian doctors also are eligible.

American Society for the Hard of Hearing

A complete list of publications covering books, films, pamphlets and posters is available by writing to the Society, Washington, D. C. The Society is unable to maintain free mailing lists. However, many of the pamphlets cost only ten cents and U. S. stamps are acceptable. Many interesting titles appear in the list and it is recommended to all those interested.

Industrial Commission Adopts Revised Medical and Surgical Fee Schedule

The Ohio Industrial Commission has adopted a revised medical and surgical fee schedule, after a series of conferences with the committee on workmen's compensation of the Ohio State Medical Association and a similar committee of the Ohio State Dental Society. A new rule on physical therapy was inserted stating that fees for physical therapy will not be approved for more than ten treatments unless authorized. Under the old rule, fees for such treatment were not allowed unless the treatment was authorized in advance by the commission.

New Dean of Dartmouth Medical School

Dr. Rolf C. Syvertsen, assistant dean of the Dartmouth Medical School, Hanover, since June, 1944 and a member of the faculty since 1923, has been appointed dean of the medical school.

"Sulfa" in Wounds Discontinued

The Army's accumulated experience in wound management does not justify the local use of any chemical agent in a wound as an anti-bacterial agent, according to the Office of the Surgeon General. The local use of crystalline sulfonamides (sulfa powder) has therefore been discontinued except in the case of serous cavities where its use, while permissible under the direction of the surgeon, is not recommended.

Permanent Establishments for Restoration of Injured Veterans

Soldiers' memorials in the form of permanent establishments for the restoration of injured veterans, rather than stone and bronze monuments, is the aim of the Baruch Committee on Physical Medicine. The subcommittee on war and postwar physical rehabilitation and reconditioning, made up almost entirely of medical corps officers of the armed services, has sent out a blueprint of an ideal war memorial. After erection of treatment centers, and as time goes on, civilian patients, especially those injured in modern industry, may be sent to the centers by their physicians or surgeons, their care helping to meet expenses. Returned veterans may be placed in centers close to their homes. So situated they will not feel

neglected and forgotten but, on the contrary, would be provided for under circumstances arranged and assembled for their rehabilitation with the sole aim of restoring them to normal life and useful activity.

Alden B. Mills Takes Up New Duties

Alden B. Mills, managing editor since 1933 of the *Modern Hospital* has resigned to become superintendent of the Collis P. and Howard Huntington Memorial Hospital, Pasadena, Calif.; he took up his new work October 15.

Control of Tuberculosis in a Metropolitan Area

A conference sponsored by the Institute of Medicine of Chicago in association with the Chicago Medical Society, the Tuberculosis Institute of Chicago and Cook County, Council of Social Agencies of Chicago and the Chicago Tuberculosis Society was held in Chicago, November 13 and 14.

A program devoted to phases of tuberculosis that are of particular importance at this time to clinicians, specialists, lay workers and interested citizens was presented.

Offers Funds to Colleges to Lure Scientists

Research Corporation, a non-profit organization, announced it was granting $2,500,000 to colleges and universities "to help attract" talented young scientists into college laboratories and teaching posts.

Dr. Joseph W. Barker, acting president of the corporation, who served as special assistant to the secretary of the navy, said most of the young scientists who would benefit from the grants were those "who made the atomic bomb, radar and a host of other vital war weapons."

"Science has performed military miracles during the war; she must not neglect to train young men for the problems of peace in the next decade or two," Dr. Barker, dean of engineering at Columbia university said.

Research corporation is financed by revenue from inventions assigned to it by public spirited inventors, Dr. Barker said.

Pamphlets Available

"Women Physicians," Bulletin 203, No. 7 and "X-Ray Technicians," Bulletin 203, No. 8, have been published as part of the series on the outlook for women in occupations in the medical services. They are issued by the Women's Bureau, United States Department of Labor.

Occupational Therapy

"The Occupational Therapy Program at Vaughan General Hospital," was the title of a talk given before the Zonta club of Chicago, recently by Miss Harriet M. Carman, OTR, Chief of the Occupational Therapy Department at Vaughan General Hospital at Hines, Illinois.

Physical Medicine in Kumming, China

At the U. S. Army Medical Corps' convalescent camp, located on a lake shore some miles from Kumming, China, skilled remedial therapeutic treatment and exercises are hastening the recovery of American troops in the China theater following hospitalization for battle injuries, major operations, fractures and other casualties. Under proper medical guidance the camp staff aided by the convalescents has constructed such reconditioning machines as wall pulleys; stall bars; finger, wrist, shoulder and leg machines; weight-lifting sets and many other devices to hasten recovery of injured muscles and limbs.

Misbranded Products

Abstracts of Notices of Judgment issued by the Food and Drug Administration of Federal Security Agency.

[Editorial Note.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D. D. N. J. and foods, F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Crab Orchard Concentrated Mineral Water.—Crab Orchard Mineral Water & Crystal Company, Inc., Crab Orchard, Ky. Shipped March 23, 1940. Composition: dissolved mineral water, chiefly magnesium and sodium sulfates, with smaller amounts of other salts. Misbranded because labeling falsely represented that the water would be an effective treatment and alleviation of conditions usually calling for a sojourn at a mineral spring; that it would relieve inveterate chronic diseases, cleanse the system of toxins and waste matter, and remove the dangers of constipation; that it would benefit conditions arising from disordered liver and kidneys, prevent attacks on the blood corpuscles by toxins engendered in the system from defective filtration or cleansing; that it would prevent depletion of the nerve cells, safeguard beauty in women and keep men fit; that it would be beneficial in treating constipation, rheumatism, headaches, influenza, colds and some other disorders, keep the blood stream pure, help skin blemishes and eruptions, maintain a clean system, improve the appetite and enable one to sleep and feel better.—[D. D. N. J., F. D. C. 889; May, 1944, J. A. M. A. 128:615 (June 23) 1945.]

Anniversary of the Army Medical Department

The Army Medical Department celebrated its 170th anniversary on July 27 of this year with

the realization that it has grown into the largest organization of the kind ever known and that it is giving this nation's army the best medical care that soldiers have ever received.

From its inception in 1775 shortly after General George Washington became Commander-in-Chief of the Continental Army until the present day, the Army Medical Department has made steady progress in military medicine; it has made scientific discoveries that have benefited all of mankind; but never has its progress in both of those categories been so rapid as in recent years.

Baruch Committee Appoints Physical Rehabilitation Consultant

Dr. Frank H. Krusen, Director of the Baruch Committee on Physical Medicine, has announced the appointment of Colonel Howard A. Rusk, Medical Corps, Army of the United States, as Consultant on Physical Rehabilitation for the Baruch Committee. Colonel Rusk, whose pioneering work as Chief of the Convalescent Division of the Air Surgeon has attracted national attention, will make his headquarters at the New York office of the Committee created a year ago by Bernard M. Baruch.

Dr. Krusen explained that the committee plans to set up a blueprint for the guidance of communities in the establishment of community rehabilitation centers or services. "Although we are not in a position to finance the construction and operation of these civilian rehabilitation centers," he said, "the committee, through Colonel Rusk and the other authorities on rehabilitation who are associated with us, will make up a formula for a general organization to handle this vital problem in the various communities of the nation. This formula will contain estimates of the personnel and the physical facilities required for an effective rehabilitation center together with the necessary administrative and professional procedures."

"The War Manpower Commission," Colonel Rusk pointed out, "estimated that there are 23 million persons in the United States who, through injury, disease, maladjustment or from their experiences in former wars, are in need of physical or functional rehabilitation, or both. It is estimated that at present there is a backlog of one million people who are in need of such care to make them employable. We consider this rehabilitation work the third phase of medical care. The first phase is preventive medicine, the second is diagnosis and treatment, and the third is physical rehabilitation."

Tenth National Assembly of College of Surgeons

The tenth (Victory) National Assembly of the Unites States chapter of the International College of Surgeons will be held December 6-8 at the Mayflower Hotel, Washington, D. C., under the general chairmanship of Dr. Custis Lee Hall, Washington. Among the speakers will be:

Dr. Emil J. C. Hildenbrand, Washington, D. C., Refrigeration Anesthesia.
Capt. Winchell M. Craig (MC) and Capt. Joseph S. Barr (MC), Reconditioning of Spinal Cord Injuries.
Dr. J. Ross Veal, Washington, D. C., Circulatory Disturbances of the Lower Extremities.

Other speakers on the program will include Col. Alfred R. Shands, M.C., and Col. Leonard T. Peterson, M.C.

Dr. Magnuson Named to Vets Research Post

Dr. Paul B. Magnuson of Dundee, Ill., a widely known surgeon and orthopedic specialist, has been appointed by the veterans administration to head a program of research and postgraduate training in veterans' hospitals throughout the country.

The new program is part of a project begun by Gen. Bradley, veterans' administrator, to improve the medical treatment available to exservice men and government institutions. Maj. Gen. Paul R. Hawley, acting surgeon general of the veterans' administration has said that new opportunities in the fields of medicine, surgery and research must be developed in veterans' hospitals to attract top ranking men to the institutions.

Dr. Magnuson will lead in the formulation of training policies for medical personnel and establishment and operation of all schools or courses of instruction in professional subjects for veterans' physicians also will be under his direction.

Albert Edward Snow

We regret to announce the passing of Dr. Albert Edward Snow of St. Louis. Dr. Snow had been a member of the Congress for many years.

Walter Bradford Cannon

The renowned physiologist, Walter Bradford Cannon, passed away at his summer home in Franklin, N. H., October 1. He had been George Higginson, professor and head of the department of physiology at Harvard since 1906, retiring in 1940 with the title emeritus. In 1925 when the American Medical Association created a council on Physical Therapy, Dr. Cannon was named one of its members.

Bernard Isaac Comroe

Dr. Comroe died at his home in Overbrook Hills, Pennsylvania, September 14, at the age of 38. Dr. Comroe is the author of one of the articles in the current issue of the ARCHIVES. He has taken part in recent meetings of the Congress. He is widely known for his contributions on arthritis.

BOOK REVIEWS

ELECTROTHERAPY AND LIGHT THERAPY WITH THE ESSENTIALS OF HYDROTHERAPY AND MECHANOTHERAPY. By *Richard Kovács*, M.D., Professor of Physical Therapy, New York Polyclinic Medical School and Hospital; Attending Physical Therapist, Manhattan State, Harlem Valley State, Columbus and West Side Hospitals; Visiting Physical Therapist, New York City Department of Correction Hospitals; Consulting Physical Therapist, New York Infirmary for Women and Children, Mary Immaculate Hospital, Jamaica, N. Y.; Hackensack Hospital, Hackensack, N. J.; St. Charles Hospital, Port Jefferson, L. I.; Alexian Brothers Hospital, Elizabeth, N. J. Fifth Edition. Cloth. Pp. 694 with 353 illustrations. Price, $8.50. Philadelphia: Lea & Febiger, 1945.

When the medical profession accords to a book the wholehearted welcome that has greeted the first four editions of this book it throws on the author the moral obligation of revisions to keep the textual material abreast of modern advances. The profession will rejoice that Kovács has continued to justify their faith by this careful preparation of this thoroughly revised fifth edition.

The story of the progress of "physical medicine" as part of the practice of medicine in the period of the past twenty-five years during which the author has been actively engaged in it is an impressive one. In the United States up to the time of World War I the few medical men practicing electrotherapy were looked on by many of their medical brethren with suspicion. The situation was first changed for the better during and after World War I. In 1925 the American Medical Association created a Council on Physical Therapy.

World War II found physical therapy ready for further expansion and its fullest utilization for the benefit of war casualties. The National Foundation for Infantile Paralysis, the Baruch Committee on Physical Medicine and the National Research Council have made grants for research in physical medicine. As a result of these developments prospects for a large scale increase in instruction, research and clinical application of physical medicine in the near future are indeed bright.

Therefore the edition is timely as it presents concisely all present day phases of physical medicine with special emphasis on electrotherapy and light therapy. The newer uses and methods of electronics, of electrodiagnosis, of ion transfer and of ultraviolet radiation have been incorporated. The chapter on exercise has been considerably enlarged, a new chapter on hypothermy has been added and a revised glossary inserted pertaining to definitions of electrotherapy as well as to muscle and nerve action and mechanotherapy. All chapters in general as well as the special part have been brought up to date. Eighty-seven new illustrations have been added and forty-nine obsolete ones omitted. This is an excellent book and should be in the library of every physician and surgeon especially at this time when physical medicine is attracting so much attention.

PHYSICAL TREATMENT BY MOVEMENT, MANIPULATION AND MASSAGE. By *James B. Mennell*, M.A., M.D., B.C. (Cantab.); Consulting Physiotherapist, St. Thomas's Hospital and late Lecturer, Massage Training School. Fifth Edition. Cloth. Pp. 512 with 288 illustrations. Price, $7.00. Philadelphia: The Blakiston Company, 1945.

The author states that one of his objects in writing this book was to place in the hands of the medical profession a book to which they could refer when issuing instructions to physical therapy technicians. A medical man who fails to issue adequate instructions may often be responsible for the failure for which the physical therapy technician is blamed. When a medical man orders the application of massage he should not try to hand over the responsibility to another. He should consider the prescription of massage in the same light as he would consider that of a potent drug and watch its effects no less closely, varying the dose and the nature of the dose from time to time according to indications.

Movement and manipulation must often accompany massage. Mennell emphasizes the distinction between passive movement and force movement. The chapter on relaxed movement (passive movement) is a classic. There are a number of excellent chapters on the treatment of recent injuries, sprain, dislocations and fractures, reeducation of muscle, reeducation in walking and reeducation of amputees.

Mennell states that "many of the views herein expressed are unorthodox." He wrote another monograph "The Science and Art of Joint Manipulation." The subject has been reviewed in a chapter in this book on "Forced Movement, Bone Setting." This expresses some unorthodox views. The great English surgeon, Watson-Jones, in his book on fractures states that manipulation under anesthesia is a two-edged sword. The procedure will undoubtedly break down adhesions but that process gives rise to a new exudation from the torn fibers that may produce fresh adhesions.

There are several chapters on backache which should be read because there is thoroughly discussed the causes and treatment of backache, with

many excellent line drawings taken largely from the author's monograph "Backache."

Mennell's discussion of the treatment advocated by Sister Kenny for infantile paralysis is interesting. The foregoing topics and many others make this a book that should be in the library of every physician.

TEXTBOOK OF NEUROPATHOLOGY. By *Arthur Weil*, M.D., Associate Professor of Neuropathology Northwestern University Medical School. Second Edition. Cloth. Pp. 356 with 289 illustrations. Price, $5.50. New York: Grune & Stratton, Inc., 1945.

The new additions to our knowledge of neuropathology have been incorporated into the revised second edition of this volume. This is reflected in an increase of illustrations from 260 to 287 and an increase in the size of the book. Such newer knowledge derives especially from the most recent studies of epidemic encephalitis, of vitamin deficiencies, of the pathology of experimental tumors of the nervous tissues and of the effects of the various forms of shock treatment.

A unique merit of this book that has been notably stressed is its manner of combining the technical standpoint of the pathologic laboratory with the broader biologic outlook of the clinic. Detailed neuro-anatomic and histopatholic descriptions, embracing every aspect of disease of the structure of the nervous system are supplemented with chemical and physicochemical data. In this aspect the book supplies a complete working manual for the student and research worker. Special technical features of the book are a set of statistical tables that convey data concerning the development and chemical composition of the nervous system, and separate sections covering the approved technic of postmortem examination of the brain and standard methods of fixation and staining.

This book is a required text in courses in neuropathology at Northwestern University Medical School and is recommended for the use of students in other medical schools.

MEDICAL EDUCATION IN THE UNITED STATES BEFORE THE CIVIL WAR. By *William Frederick Norwood*, Associate Professor of the History of Medicine and Associate Dean of the School of Medicine, College of Medical Evangelists, Los Angeles. Foreword by *Henry E. Sigerist*. Cloth. Price, $6.00. Pg. 487. Philadelphia: University of Pennsylvania Press, 1944.

This first complete picture of the evolution of American medicine from early colonial times up to the Civil War is a well written and important contribution to the nation's medical annals. Perusal of the twenty-seven page bibliography indicates that the author has drawn his material from books and manuscripts dating back as far as the early eighteenth century. The volume is divided into the following parts: introduction, factors in early American medical education, medical schools in Pennsylvania, the schools of New York State, medical schools of New England, the schools of the old South, the schools of Transppalachia, and evolution of the American system of medical education.

Medical care in the early colonial period was primitive, furnished by clergymen, politicians, barbers, butchers and others who used the healing art as an interesting avocation or as a means of supplementing scanty incomes. In later colonial days a few qualified physicians trained in European schools were sprinkled through the colonies. The earliest medical education was the preceptor system. Young men apprenticed themselves or were apprenticed by their parents to medical practitioners for seven-year periods. During this time their duties varied from the most menial tasks to those of a highly professional nature. Fortunate indeed was the young man who obtained a conscientious preceptor. With the rise of the medical schools after the Revolutionary War, the apprenticeship period was reduced to three years.

Before the end of the eighteenth century, four medical schools had been started in the United States: the medical department of the College of Philadelphia, the school of medicine of King's College of New York City, Harvard Medical School, and the medical school of Dartmouth College. Shortly after the turn of the century the College of Physicians and Surgeons of New York City and the College of Medicine of Maryland opened their doors. The period from 1820 to the beginning of the Civil War witnessed the rise of the proprietary medical schools, a chapter in the history of American medicine which is not a credit to the profession. However, some good schools did develop during this period. As one reads of the humble beginnings of the great present-day medical schools, one is reminded again that it is not wise to despise the day of small things.

The author has added the human interest side to this historical narrative by frequent references to professional activities and relationships of the period. There was the clash between, the one time friends, John Morgan and William Shippen in connection with the founding of the medical department of the College of Philadelphia, now the University of Pennsylvania Medical School. There was Charles Caldwell of the Transylvania Medical Faculty, who, "for consummate conceit stood without a peer." His controversy with James C. Cross in the 1830's was an example of the numerous and often petty disagreements which occurred among medical men of the day. The turbulent state of American medicine during the period covered by this volume coincided with the similar social and political conditions in the rapidly developing young republic. Nevertheless, there were many able medical teachers and practitioners developed during this time. Among them were Benjamin Rush, Joseph and John Warren, Nathan Smith, Daniel Drake and many others.

The last section of the volume, the "Evolution of the American System of Medical Education," contains interesting chapters on apprenticeships

and medical faculties, financial support of medical schools, cost of medical training, medical curricula and teaching problems, degrees and licensure, women and medical education, rise of the sectarian schools and reform movements. Of particular interest in this section is the chapter on women and medical education containing the account of Elizabeth Blackwell, the first woman physician and her sister, Emily.

Every physician who is at all interested in early American medicine should possess this volume. It is complete, authoritative and entertainingly written. It is a recommended addition to any medical library, private or public.

OPERATING PROCEDURES FOR INDUSTRIAL DISPENSARIES. Army Service Forces Manual, M 210. Paper. Pp. 28. Washington, D. C.: U. S. Government Printing Office, 1945.

This manual presents a guide to be followed in establishing and maintaining adequate medical service for employees in Army-owned and Army operated industrial installations. Depending on the personnel available in the industrial medical department and the type of industry, some of the subjects mentioned should be stressed to a greater degree than others. A well-run medical department will have a definite effect on decreasing absenteeism, increasing production, and reducing operating costs.

FOUNDATIONS OF NEUROPSYCHIATRY. By *Stanley Cobb,* A.B., M.D., Bullard Professor of Neuropathology, Harvard Medical School, Psychiatrist in Chief, Massachusetts General Hospital. Third revised and enlarged edition of the work formerly known as "A Preface to Nervous Disease." Cloth. Pp. 252. Price, $2.50. Baltimore: The Williams & Wilkins Company, 1944.

The new title of the third edition of this book, which was formerly known as "A Preface to Nervous Disease," is more descriptive of the book in its present form. Since the publication of the first edition in 1936, its eminent author has enlarged and revised the text and has now added a chapter on psychology and has carried out his original scheme of first considering normal anatomy and physiology and following with a consideration of neuropathology. In this chapter, problems of normal psychology are discussed and Dr. Cobb points out that these are the problems which "ought to be understood by medical men before they attempt to understand pathological mental processes."

The book is divided into thirteen chapters as follows: (1) autonomic nervous system, (2) segmental and suprasegmental aspects of the cerebrospinal nervous system, (3) motor integration and locomotion, (4) functional localization in the cerebral cortex, (5) "consciousness" and the "mind-body" problem, (6) cerebral circulation, (7) cerebrospinal fluid, (8) general neuropathology, (9) the peripheral nerve and neuritis, (10) special neuropathology, (11) epilepsy, (12) some psychological concepts important in medicine and (13) psychopathology.

The author has succeeded exceptionally well in his avowed purpose which was "to give to practitioners and students of medicine the facts and correlations needed to understand the simpler workings of the central nervous system." Dr. Cobb has a clarity of style and simplicity of presentation which renders his book easily readable and thoroughly informative. For example, in his introduction, he has stated that a diagram may illustrate the relationship between psychiatry and certain other sciences and he continues his discussion as follows: "Psychiatry is represented as a pyramid, its apex being philosophy and its base physics, anatomy, and chemistry. Any other science could be similarly schematized as a pyramid; for each the apex would be philosophy and the base would be made up of more exact sciences in which measurable data are used. Putting all these completed pyramids together, apex to apex, would make a polyhedron containing all knowledge; it would have a shell of science and a core of philosophy."

Any physician who wishes a readable guide to the foundations of neuropsychiatry as related to medical practice would do well to obtain this excellent textbook.

CLINICAL ROENTGENOLOGY OF THE DIGESTIVE TRACT. By *Maurice Feldman,* M.D., Assistant Professor of Gastroenterology, University of Maryland, Assistant in Gastroenterology, Mercy Hospital, Consulting Roentgenologist, Sinai Hospital. Second Edition. Pp. 769. Price, $7.00. Baltimore: The Williams & Wilkins Company, 1945.

This is an authoritative presentation of the clinical roentgenology of the diseases of the gastrointestinal tract and related conditions based on 26 years of experience. The pathology of the gastrointestinal tract and its roentgenological aspects are thoroughly considered. There is a total of 551 excellent illustrations. The first edition of this useful volume was published seven years ago and the present edition has been brought fully up-to-date and presents a large amount of pertinent literature reference. The author constantly stresses the importance of the association of the roentgenological study with the clinical aspect of these affections. This volume therefore offers invaluable aid to the roentgenologist, gastroenterologist student and general practitioner.

A SHORT HISTORY OF NAUTICAL MEDICINE. By *Louis H. Roddis,* M.D., Captain, Medical Corps, United States Navy. Cloth. Pp. 359, twelve illustrations. Price, $3.00. New York and London: Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, 1945.

Nautical or maritime medicine is the branch of medical science which deals with the prevention and treatment of diseases peculiar to maritime or nautical life. With the present day huge expansion of our naval forces, the historical background of its medical department is of special interest.

This little volume is a reprint of a series of articles originally appeared in the *Annals of Medical History,* May to September, 1941. It gives a history of maritime medicine into which some of the story of naval medicine in the U. S. Navy has been included. There are nine chapters in the book. "Early nautical medicine," describes the development of the practice of quarantine as the chief contribution. "Disease and disaster of the old sailing ships," reports on the first observations on scurvy and its cure by lemon juice and other green herbs and vegetables, also on the efforts to combat typhus fever, cholera and venereal diseases; among the non-contagious conditions met with were seasickness, falls on deck and falls overboard. "The Medical departments of naval vessels" discusses the origin of the term "sick bay," the early handling of wounded in naval battles and treating of the special types of wounds due to naval warfare; it also describes the routine of the other duties of the naval surgeon. "The rise of naval hygiene" reports on drinking water, the first attempts of distillation drainage, ventilation and air supply; also on such special aspects of the sailor's diet and drink as hard tack, lobscouse and grog; it also portrays the profound changes in naval hygiene due to the change from wooden to steel ships and later to screw propellers. The titles of the last four chapters are: Naval medicine in the United States Navy, hospitals for seamen and hospital ships, nautical medicine and the merchant marine, the uniforms and insignia of medical men afloat, and research in nautical medicine. Twelve illustrations, including some reproductions of early treatises and early case reports add to the vividity of presentation. This is indeed a stimulating volume of equal interest to medical men and to the public.

SURGERY OF MODERN WARFARE. Edited by *Hamilton Bailey,* F.R.C.S., Surgeon, Northern Royal Hospital, London; Surgeon, E.M.S.; Surgeon and Urologist, County Hospital, Chatham; Senior Surgeon, St. Vincent's Clinic and the Italian Hospital; Consultant in Genito-Urinary and General Surgery, Peterborough Hospital; Consulting Surgeon, Essex County Council and Clacton Hospital;; Formerly External Examiner in Surgery, University of Bristol; Temporary Surgeon-Lieut. Royal Navy. Sub-Editor for Medicine, *G. Allan Birch,* M.D., M.R.C.P., D.C.H., D.P.H., M.M.S.A., Senior Physician, North Middlesex County Hospital. Compiled by Seventy-Seven Contributors. Third Edition. Two Volumes. Cloth. Pp. 1108 with 1128 illustrations. Price, $20.00. Baltimore: The Williams & Wilkins Company, 1944.

These volumes have been written by a team which represents British surgery. The contributors do not belong to a particular school nor are they drawn from any one medical service. Reflected in its pages is teaching from London, the Provinces, Scotland, Wales and Ireland, and experience culled from the Navy, Army, Air Forces and Emergency Medical Service. Some of the contributors base their views on observations made during the present conflict; others record ripe experience amassed during 1914-1918; and not a few are able to contrast and compare the surgery of both campaigns.

Volume one considers the general considerations of projectiles and other engines of destruction, and war wounds; the general condition of the casualty and his resuscitation; frost bites, burns and skin grafting; anesthetizing the wounded; general operative consideration of wounds; special infections, special consideration of wounds, wounds of blood vessels, immobilizing the limbs and amputations.

In volume two there is discussed wounds of bone and joints; hand and foot; tendons and peripheral nerve injuries; wounds and injuries of the spine; wounds of the head, neck, eye and orbit, of the trunk, otorhinolaryngology in relation to war injuries and administration.

The third edition has undergone a thorough revision. The illustrations are many and excellent. There are many new drawings and some of the old ones have been improved. The superbly produced color photographs add to the reader's instruction.

As the war is now over it should be remembered that industrial surgery and war surgery are akin. Industrial surgery is always with us, happily war surgery is not. The experience recorded here of war surgery can be harnessed to industrial surgery. These volumes can be highly recommended to industrial surgeons of the United States, as every contributor is an authority in the field which he considers.

FUNDAMENTALS OF PSYCHIATRY. By *Edward A. Strecker,* M.D., Sc.D., F.A.D.P., Professor of psychiatry and Chairman of the Department, Undergraduate School of Medicine, University of Pennsylvania; Psychiatrist to the Pennsylvania Hospital; Attending Psychiatrist, Psychopathic Division, Philadelphia General Hospital; Consultant to the Bureau of Medicine and Surgery, United States Navy; Consultant to the Secretary of War, A. A. F. Cloth. Pp. 222. Price, $3.00. Philadelphia: J. B. Lippincott Company, 1945.

In a review of the first edition of this publication it was stated that the raison d' être for the book was given in a sentence appearing in an introductory chapter, which was, "Each doctor whether he is a medical officer or remains in civilian life to give medical aid to the noncombatant population, must needs acquire a minimum of psychiatric information and skill."

This book, which was described as a "workable picture of the field of psychiatry," has apparently proved to be useful to the general practitioner and to the psychiatric student. Now in its third edition, it seeks the laudable aim of including valuable information about the nursing of the psychiatric patient and about civilian aspects of war psychiatry. By these means this publication extends its interest not only to a complementary field of psychiatry, the nursing care of the patients, but to the social sphere, calling attention to the importance of psychiatric com-

prehension of our actual human conditions in the development of a future better prepared and balanced civilization.

The chapter "Psychiatry and War" includes many amplifications of the same chapter of previous editions and considers carefully the role of the civilian as affected by the ordeal of war conditions and conversely as influencing the post-war reconstruction, pointing to the importance and necessity for well-conducted psychiatric organizations.

The new chapter "The nurse and the psychiatric patient" offers sound counsel to the nurse specializing in psychiatric care as well as to the nurse in general practice. It indicates to the psychiatrist the method of handling the psychiatric patient and so forth. Definite suggestions are given in this respect to the physician and the interested nurse.

The book can be highly recommended as a small compend in psychiatry for the physician and nurse who are not primarily trained in psychiatry.

TECHNIC OF BANDAGING AND SPLINTING, INCLUDING SECTIONS ON SLINGS AND ADHESIVE PLASTER STRAPPINGS. By *Arthur M. Tunick*, Major of Medical Corps, Army of the United States. Cloth. Pp. 206 with 250 illustrations. Price, $3.00. New York: Essential Books, 1945.

This book has been written for all those who might be called on to apply a bandage or splint a broken bone. Its language is non-technical and its illustrations are excellent and self-explanatory. It is not intended for medical students and nurses alone and it is not assumed that the reader has had prior bandaging instructions. Now that the war is over the book is recommended to those on the home front as furnishing a comprehensive survey of the modern methods for dressing and transporting the injured.

THE MEASUREMENT OF ADULT INTELLIGENCE. By *David Wechsler*, Ph.D., Chief Psychologist, Bellevue Psychiatric Hospital, Assistant Clinical Professor of Medical Psychology, New York University College of Medicine; Lecturer, School of Eduation, New York University. Third Edition. Pp. 258. Cloth. Price, $3.50. Baltimore: The Williams & Wilkens Co., 1944.

The author of this book is an outstanding and a most experienced psychologist in the clinical field who devised the now well-known Bellevue Adult Intelligence Test. The book deals primarily with a description and evaluation of this test, however, general concepts concerning intelligence and its measurement are given prominence and are discussed in a highly stimulating manner. The volume is divided into three parts, the first dealing with *The Nature and Classification of Intelligence*, the second with *The Bellevue Intelligence Scales*, while the third part constitutes a *Manual of Bellevue Intelligence Tests*. Following are the chapter headings: 1. Nature of intelligence; 2. Need for an adult intelligence scale; 3. Concepts of mental age and I. Q.; 4. Classification of intelligence; 5. Concept of mental deficiency; 6. The problem of mental deterioration; 7. Selection and description of tests; 8. population used in standardizing tests; 9. Standardization and results; 10. Limitations and special merits and 11. Diagnostic and clinical features. Dr. Wechsler developed this test in order to meet the long standing need for a scale specifically designed to measure the intelligence of the adult individual. He points out that almost all available intelligence tests were characteristically standardized on children and have been uncritically applied to the measurement of adult intelligence, a procedure which lacks any scientific justification. Furthermore, most of the material included in those tests were adopted with a view of attracting the attention of children and therefore are not suitable for sustaining the interest of the adult. In the development of the Bellevue scale the author tried to eliminate precisely those shortcomings. The test was adequately standardized on an adult population and age norms ranging from 10 to 59 years are available. In examining the standardization process and selection of the test items, Wechsler's primary interest as a clinician is reflected. He maintains that the statistical factor alone is far from being an adequate criterion for the selection of test items and in order to be considered valid, all tests ultimately must be able to withstand clinical scrutiny. The clinical merits of the test are discussed in the last chapter, *Diagnostic and Clinical Features*, which, due to more extensive clinical experience, was subject to most of the changes in the third edition of the book. It is pointed out that an intelligence test should furnish the psychologist not only with the numerical I. Q. but should also provide data which permits evaluation of the kind of intelligence and the particular intellectual make-up of the individual tested. It was found that the test performance patterns vary characteristically with the various psychiatric categories, an observation which proved to be of considerable aid in diagnostic work. For instance, the test has already been found a valuable and sensitive indicator of mental deterioration based on intracranial organic pathology. However, more research directed toward the establishment of more objective quantitative data seems indicated.

The book is well organized and clearly written. It is highly recommended reading for all those who deal with problems of human adjustment.

AN OUTLINE OF TROPICAL MEDICINE. By *Otto Saphir*, M.D., Director of the Department of Pathology of the Michael Reese Hospital; Professor of Pathology, University of Illinois College of Medicine. Cloth. Price, $1.00. Pp. 86. Chicago: The Michael Reese Research Foundation, 1944.

The author of this little volume emphasizes that it is merely an outline giving the barest essentials of the more important tropical diseases. The

subjects considered in the seven short chapters are: virus diseases, Rickettsial diseases, leishmaniasis and trypanosomiasis, Treponemas and Leptospirae, bacterial diseases, malaria and helminthic infections. At the end of each chapter is a short list of references. Discussions of the individual diseases are concise and the author advises that more complete works be consulted for further details. Diseases caused by fungi and vitamin deficiencies and intoxications caused by snakes, spiders and leeches are not included. Amebic and bacillary dysentery are also omitted.

The book is recommended as a time saving brief outline of tropical medicine which can be supplemented when necessary by more complete works.

D. T. WATSON OF COUNSEL. By *Francis R. Harbison.* Cloth. Pp. 302. Pittsburgh: David & Warde, 1945.

Those familiar with the field of physical medicine at once associate D. T. Watson with the home for crippled children bearing his name and also the school for training physical therapists. It will be an interesting and educational experience for readers of this book to learn in a rather detailed and intimate way of national and even international lawsuits in which Watson played an important role. These include the "Bull Ring," the Northern Securities, the Alaskan Boundry Case, to name only a few. Watson was closely connected with the great industrialists of his time, including Rockefeller, Carnegie, Vanderbilt, Phipps, Frick and others. Although in the early chapters there is perhaps more detail than is interesting to the general reader, one soon becomes fascinated in following the exceptional accomplishments of this eminent lawyer.

PERSONAL AND COMMUNITY HEALTH. By *C. E. Turner,* A.M., Sc.D., Dr. P.H., Professor of Public Health in the Massachusetts Institute of Technology; Formerly Associate Professor of Hygiene in the Tufts College Medical and Dental Schools; Sometime Member of the Administrative Board in the School of Public Health of Harvard University and the Massachusetts Insitute of Technology. Cloth. Pp. 585, adequately illustrated with charts, diagrams, and photographs. Price, $3.50. Seventh edition. St. Louis: The C. V. Mosby Company, 1943.

This well known volume on personal and community health is designed for use as a teaching text in universities and colleges. It contains knowledge that educated men and women need in order to discharge intelligently their responsibilities in health promotion in the home, in the place of employment and in the community. It is written in a clear concise style which is not too technical for the student of college grade. The student who endeavors to use personally the information gained by a study of this text will profit greatly.

The book is divided into two parts. Part I contains nineteen chapters devoted to personal health and Part II is made up of eleven chapters on community health. Enough anatomy and physiology are presented to form an adequate background for the discussion of hygienic care. Some of the subjects discussed are nutrition, digestion, respiration, circulation, the kidneys, the skin, the endocrine glands, mental hygiene, the hygiene of reproduction, and narcotics and simulants. Of especial interest in the field of physical medicine are three chapters on exercise. Chapter 13 discusses the anatomy and physiology of the skeletal and muscular systems and suggests exercise suitable for the various age groups from the cradle to the grave. Chapter 14, on body mechanics, points out the prevalence of postural defects and briefly considers their correction. Chapter 15 deals with the anatomy and physiology of the feet and discusses foot hygiene and exercises.

Part II, on community health, contains chapters on disease prevention, communicable diseases, immunity, syphilis, tuberculosis and the common cold, food and water control, waste disposal, ventilation, heating and lighting, public health administration, maternal and child hygiene and industrial hygiene. An important chapter in this section is that on disease prevention. The brief though lucid discussion on the work of Pasteur and Koch in the development of bacteriology and that of Jenner in smallpox prevention should be an excellent antidote to anti-vaccination propaganda. Appendix A contains important information in outline form on the control of the communicable diseases. Each disease is discussed under the subheads: (1) recognition of the disease; (2) etiological agent; (3) source of infection; (4) mode of transmission; (5) incubation period; (6) period of communicability; (7) susceptibility and immunity; (8) prevalence, and (9) methods of control.

The importance of this text in the health of the college student cannot be over emphasized. It would be well if every student could be persuaded or required to take a course in personal and community hygiene. This volume would also be of great value to any others who are interested in the theme presented.

FRACTURES AND ORTHOPAEDIC SURGERY FOR NURSES AND MASSEUSES. By *Arthur Naylor,* Ch.M., M.B., M.Sc., F.R.C.S. (Eng.), F.R.C.S. (Edin.), Resident Surgical Officer, Westwood E.M.S. Hospital, Bradford Examiner in Surgery, General Nursing Council Medical Officer in Charge of the Rehabilitation Department, Westwood E.M.S. Hospital. Foreword by *Ernest Finch,* M.D., M.S. (Lond.), F.R.C.S. (Eng.), Professor of Surgery, University of Sheffield. Pp. 288, with 243 illustrations. Cloth. Price, $5.00. Baltimore: The Williams & Wilkins Company, 1945.

There is a definite shortage of textbooks which are written especially for nurses and physical therapists, as the standard textbooks for medical students and physicians are generally unsuitable

for elementary students. This book is consequently one which has been greatly needed and should prove of great value to teachers and students. Physical therapists have always largely been concerned with orthopedic conditions, and nurses called on to treat a large number of war and industrial casualties will find a greater knowledge of orthopedic nursing essential. The first chapters are devoted to description of orthopedic apparatus including some surgical devices and technics. There are numerous illustrations, including photographs and line drawings, clearly showing different types of traction, splints, application of plaster, etc. One chapter is devoted to exposition of the general methods of correction of deformity, including defects of skin, tendon muscle and bone. The remaining chapters give clear and concise descriptions of symptoms, outstanding physical signs, important roentgenographic changes, and general principles of treatment in the various traumatic and pathologic conditions affecting bones, joints and soft tissues, including congenital deformities, growth disturbances and peripheral vascular lesions. A special chapter deals with the subject of orthopedic surgery in paralytic states, including infantile paralysis and spastic paralysis. As intended and as is desirable, the language is as far as possible simplified. Where more than one method of treatment may be used, each is briefly described without unnecessary discussion. As there are numerous proper names used to indicate diseases and methods of treatment in orthopedic surgery, a welcome addition might be a glossary of terms. Since proper bodily mechanics are so important in securing best results in orthopedic surgery, more emphasis might have been placed on posture and the use of walkers, crutches and canes. Aside from this, the book is quite complete, well written and illustrated and is highly recommended.

SYNOPSIS OF NEUROPSYCHIATRY. By *Lowell S. Selling,* Sc.M., M.D., Ph.D., Dr. P.H., Director, Psychopathic Clinic, Recorder's Court, Detroit, Mich.; Associate Attending Neuropsychiatrist, Eloise Hospital; Adjunct Attending Neuropsychiatrist, Harper Hospital. Cloth. Price, $5.00. Pp. 500. St. Louis: The C. V. Mosby Co., 1944.

Modern progress in the recognition and treatment of nervous and mental disorders has brought about the development of two special fields in medicine which are at once independent and overlapping; neurology, and psychiatry. This synopsis aims to offer a background of neuropsychiatry for diagnosis and treatment. It is divided into two parts; neurology and neuropsychiatry. The first and larger part includes a systematic presentation of the neuro-anatomy and neuropsychology of the basic nervous structure and peripheral nerves, the spinal cord, the brain stem, the cranial nerves, the cerebellum, cerebrum, meninges and of the autonomic and sympathetic nervous system, of muscle syndromes and of the convulsive states. All this will make the organic neurologic syndromes comprehensible. In the second part psychopathology, abnormal psychology and psychoanalysis are being presented in the same degree to provide a background for the understanding of the functional disorders, the psychoses, psychoneuroses and psychopathic personality, also including chapters on malingering, orthopsychiatry and mental deficiency. The volume is well written and concise and should be equally welcome by the medical student and the general practitioner as a standardized guide, as well as by the specialist for a review of his subject.

PSYCHIATRY FOR NURSES. By *Louis J. Karnosh,* B.S., Sc.D., M.D., Associate Clinical Professor of Nervous Diseases, School of Medicine, Western Reserve University; Director of Neuropsychiatry, City Hospital, Cleveland; Consulting Neuropsychiatrist, Cleveland Clinic; and *Edith B. Gage,* R.N., Formerly Supervisor, Neuropsychiatric Division, City Hospital, Cleveland; in collaboration with *Dorothy Mereness,* A.B., M.N., R.N., Instructor of Psychiatric Nursing, Neuropsychiatric Division, City Hospital, Cleveland. 339 pages. Second Edition. Cloth. Price, $2.75. St. Louis: The C. V. Mosby Company, 1944.

This textbook has been revised to include some of the newer developments in diagnostic methods and treatment of psychiatric conditions, such as electroencephalography, Rorschach and other tests, and the concept of body-mind relationship brought out under the term psychosomatic medicine. Electric shock is noted as one of the newer developments in therapy. The classification and description of mental disorders is presented clearly and concisely in a style suitable for student nurses, including illustrative case histories. Introductory chapters deal briefly with the structure of personality, including physical and emotional components, and the common psychologic mechanisms used in adjustment to environment. The practical aspects of nursing and treatment are presented individually for each condition under discussion with avoidance of vague generalities. The subjects of physical therapy, occupational therapy and mental hygiene are also adequately covered. For teaching purposes there are questions at the end of each chapter and selected references. This book is recommended as an adequate text in psychiatry for nurses.

WOMAN'S MEDICAL PROBLEMS. By *Maxine Davis.* No illustrations. Pp. 220. Price, $2.00. New York: Whittlesey House, McGraw-Hill Book Company, Inc., 1945.

This book is written by a lay author and is meant to be read by the average woman. The author states it is for, "the woman who knows nothing of medicine and who does not want to clutter her mind with scientific or pseudoscientific knowledge outside her realm. It is designed for the woman who has average problems peculiar to womankind and who wants to know how to

cope with them sensibly." The author carefully points out that she is not trained in medicine and that she is trying to present the common medical problems of women, using the best authorities that she could find in putting this information into language easily understood by the average reader. She does not attempt to give the exceptions nor discuss diverse opinions. She discusses the various problems in a sensible, simple manner at all times urging proper medical care. She attempts to debunk some of the old unproved statements relative to some of the common ailments of women.

The book is written with the assistance of well-known obstetricians and gynecologists. The foreword is written by Dr. Fred Adair.

The subjects discussed are menstruation, pregnancy, complications of pregnancy, miscarriage, abortion, childbirth, cesarean births, contraception, rhythm, sterility, menopause, women at work and some of the common diseases of women. In consideration of all these various topics the author has made a sensible approach, has presented the subject in a simple manner and has not implied that she has always described the latest developments. Some medical authorities may disagree with some of her statements but there should be no great disagreement due to the fact that she has been cautious and practical in her statements and has been carefully guided.

The book should be highly recommended to young women particularly.

CHINA'S HEALTH PROBLEMS. By *Szeming Sze,* General Secretary, Chinese Medical Association: Editor, Chinese Medical Journal. Third edition. Cloth. Pp. 76, no illustrations. Price, $1.00. Washington, D. C.: Chinese Medical Association, 1944.

This third edition of the present volume in as many years indicates American interest in China's health conditions. With a population of 400,000,000, a daily morbidity of 16,000,000 and an annual death rate of 10,000,000 persons, China has only 12,000 physicians and 38,000 hospital beds. According to American standards of medical service, China should have 266,000 physicians and 2,000,000 hospital beds. The infant mortality rate is 200 per thousand; the maternal rate, 15 per thousand. One-third of the population have trachoma; eight per cent, tuberculosis, ten per cent, venereal disease, and there are 1,000,000 lepers. Beri beri, pellagra, osteomalacia and xerophthalmia are common.

Since 84 per cent of China's population live in rural districts and are unable to pay for private medical care, state medicine appears to be the only solution. A beginning has been made under the direction of the National Health Administration with the establishment of hsien (district) health centers, provincial hospitals and provincial medical centers. Of 370 hospitals in China, 310 are not government controlled and of these 235 are Protestant mission hospitals. The thirty Chinese medical schools graduate only 500 physicians each year. There are also five schools of pharmacy, 22 schools of midwifery and 317 schools of nursing. There are two groups of medical practitioners, the Chinese Medical Association, with a membership of 300, composed of the better qualified medical men, and the Medical Practitioners' Federation, a large professional union, made up mostly of poorly qualified members.

Civilian medical relief under the National Health Administration and the National Relief Commission, supported by the Chinese Red Cross, has been aided substantially from abroad. The National Health Administration is organized into a number of subsidiary organizations and departments, for the more efficient administration of the public health. Each hsien and province has its own health organization additional to the National Health Administration. American help to China was organized in 1941 under the United China Relief, made up of a group of eight cooperating agencies. During the years 1941, 1942, and 1943 UCR raised approximately $19,000,000 which was allocated as follows: medical and public health, 35 per cent; education, 20 per cent; child welfare, 15 per cent; economic rehabilitation, 10 per cent; social rehabilitation, 10 per cent, and disaster relief, 10 per cent.

This brief résumé of the China's health problems, is well written and gives an excellent idea of the present status of medicine and public health in that country.

AN INTRODUCTION TO THE MEDICAL SCIENCES FOR MEDICAL RECORD LIBRARIANS. By *J. H. Neese,* M.D., and *F. H. Swett,* Ph.D., Cloth. Pp. 223. Price, $2.50. Durham, N. C.: Duke University Press, 1944.

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PHYSICAL MEDICINE ABSTRACTS

The Spas and the People.

Brit. J. Phys. Med. **8**:33 (March-April) 1945.

A health conscious nation, seeking the optimum in mental and bodily fitness, looks to the amenities of climate, situation, soil and atmosphere of its geographical position and tries to make use of whatever there may be available.

There is suggested five or six classes of invalid, temporary and partial, which can be differentiated, and for each class the spa has benefits to offer. If the fit person is regarded as being in the index of 100, there are various grades of people according to the ratable value of their general health. There must be a great army of people, who are just tired and want to recover pleasantly from fatigue, who may be placed in the 80 to 90 index. Convalescents from illness and accident, each has his own index. Thirdly there is the mild but partly incapacitating illness, which causes loss of ordinary "living time." In this group the early fibrositics and arthritics may be found and when they reach the spa their index may be as low as 40. Another group contains people who have some irreversible process at work but who might be made up to the fullness of their own power by spa treatment. Added to the purely physical benefits of a spa, there are also available the benefits of a holiday and not a hospital environment, healthy leisure with amusements such as good music and suitable diet, exercise and recreation.

Chest Pain and Heart Disease. Treacy H. Duerfeldt.

Northwest Med. **44**:188 (June) 1945.

Bursitis, myalgia or arthralgia of the left shoulder may be mistaken for coronary trouble when the patient complains of pain on walking, since swinging the arm or other exercise tends to bring on the pain. More confusing is the picture when the middle aged person complains of the shoulder pain, aggravated by such exercise as reaching up, and you even find the deltoid muscle tender to touch, yet the trouble is coronary insufficiency and there has developed the uncommon spasm of the pectorial and deltoid muscles as a reflex condition.

Spondylitis or spinal arthritis is known to cause root pains which are increased by movement. When these occur in the chest, we must be sure to ask whether the pain is increased by all movements or only by such exertions as walking, and the differentiation made. Similarly, the type of exertion or movement must be investigated, when the patient with an old spondylitis involving the lower back begins to complain of chest pain. This may be due to coronary disease.

Chronic Headaches. John R. Williams, Jr.

North Carolina M. J. **6**:241 (May) 1945.

Numerous investigators, including Cyriax, have pointed out that cervical arthritis and myositis in the neck can produce typical vascular headaches. In such cases tender areas are usually present in the neck, and movement of the neck is painful. Heat, especially in the form of diathermy and deep massage to the neck muscles are of value in treatment. Occasionally good results can be obtained by the injection of these tender areas with large amounts of novocaine or nupercaine in oil.

Treatment of Deafness, Ear-Noises and Dizziness by Hypothermic Therapy. Sverre Quisling.

J. Lancet **65**:222 (June) 1945.

Hypodermic therapy is based on three well-known and proven physiologic phenomena: The phenomenon of paracusis Willisii, i. e., the well known improvement in hearing noted by sufferers of otosclerosis in the presence of loud noises such as experienced when riding in trains, in the presence of loud music, or when working in factories; the marked stimulating effect of cold water run into the external ear as induced by a nystagmus due to stimulation of the vestibular division of the eighth nerve; the proven fact that interference with the circulation of the labyrinth will cause deafness, head-noises and dizziness, varying in degree with the extent of the anemia induced. The reason for using cold to stimulate the eighth nerve was the well-known sensitivity of the vestibular division of the eighth nerve to cold, a sensitivity also found to be present in the cochlear division. Furthermore, since the symptomatology of deafness, head-noises and dizziness in general follows anemia of the nerve endings of the eighth nerve, when the blood supply is increased, such symptomatology might reasonably be expected to be reversed.

After thoroughly testing the ears to remove all possible etiologic factors which will enhance return to normal hearing, a tube of ethyl chloride is obtained and the skin surface posterior to the external ear over the vestibular petrous portion and mastoid portion of the temporal bone is sprayed until it blanches. The skin is allowed to thaw out about one-half to one minute when the area is warmed by the hand of the operator. The procedure is repeated two or three times over each ear area. In thin-skinned individuals it is advisable to warm the skin with the hand immediately after it blanches, to prevent frostbite. The treatment is repeated once or twice per week for a period of six to twelve treatments. If improvement is noted, the treatments are con-

tinued for a period until no further improvement is necessary. The treatments may be repeated at monthly intervals thereafter from three to six months to insure that the condition will be relatively permanent.

After-Results of Treatment of Severe Lupus With Finsen Light (8 Cases). A. Burrows.

Proc. Roy. Soc. Med. **38**:145 (Feb.) 1945.

These cases of lupus vulgaris illustrate how good the results of treatment may be, even where the disease is advanced. Seven of them are also in contrast with the only male patient, who has a recurrent nodule in a nasal skin graft.

There is some criticism of the use of Finsen light in such cases; it is said that it is only valuable in the early condition, but these patients show the results which can be obtained in later cases.

Effects of Temperature Change on the Water Balance in Man. C. Lockard Conley, and John L. Nickerson.

Am. J. Physiol. **143**:384 (March) 1945.

The extrarenal water loss was quite constant during any period of uniform temperature. On change of the environmental temperature, the extrarenal water loss and the skin temperature quickly attained new levels. There was no evidence of slow acclimatization.

The renal excretion of sodium and chloride appeared to reflect the difference between the intake of these substances and the quantities lost in the sweat.

A pronounced and prolonged increase in plasma volume was found on exposure to heat. On exposure to cold the plasma volume was reduced but tended to return toward normal within a few days.

Spa Treatment and the Injured Workman. G. R. P. Aldred-Brown, and J. Bastow.

Brit. J. Phys. Med. **8**:36 (March-April) 1945.

Spa treatment means treatment at a spa. Although the spas in Great Britain are few in number and although still fewer have the requisite medical and surgical skill combined with their hydrologic facilities, spas should take a share in any national rehabilitation scheme. For large numbers of injured workmen the spa should be the accelerator of clinical progress and the means to ensure a rapid return to work.

Two examples are given of injuries involving joints, (a) internal derangements of the knee. (b) The "sprained" shoulder, associated with an incomplete tear of the supraspinatus muscle, and the shoulder stiff from periarticular adhesions which needs to be broken down under an anesthetic. In both, the movements difficult to regain, of the shoulder, take place when assisted by the effect of the water.

Complicated fractures, especially compound injuries with extensive muscle and tendon damage respond to hydrotherapy.

After removal of a plaster spica applied for fixation of a compound fracture of the humerus or of the femur, there is always an awkward period when the injured man misses the support of the plaster. The effect of immersion in a bath assists efforts to regain movement in the stiff joint, to exercise the weak muscles and to walk without external support.

Muscular and ligamentous injuries of the spine benefit from hydrotherapy. These are associated with anxiety states out of all proportion to the severity of the injury. The sense of wellbeing, absence of nocuous stimuli and ease of movement induced by the hot pool do much to alleviate the mental stress and encourage the man to regain free spinal movement. This is especially true after manipulation under anesthesia in order to break down adhesions.

Injuries complicated by paralysis are discussed. All paretic cases respond admirably to release from the drag of gravity. Two examples are deltoid paralysis after shoulder dislocation and footdrop after external popliteal paralysis.

Spa treatment is ideal for many kinds of injury to the workman; its efficacy secures confidence and stimulates desire for early recovery.

Lupus Erythematosus Disseminatus. Randolph P. Pillow, and Lester J. Palmer.

Northwest Med. **44**:143 (May) 1945.

The present therapy of the disseminated type is largely supportive and consists of bed rest and avoidance of ultraviolet light, adequate high calory diet, blood transfusions as needed, salicylates and codeine, avoidance of parenteral use of heavy metals and removal of any infectious focus during quiescent periods. Cannon recently reported improvement by the use of iodine orally.

Rehabilitation in a Naval Hospital. H. Jackson Burrows.

Lancet **12**:371 (March 24) 1945.

The important part of the duties of the physical therapist is instruction in and supervision of progressive exercises. The opposite popular tendency, the almost total neglect of such accessory methods as heat and electrical stimulation, is also avoided.

Passive movements, except as manipulations under anesthesia, are generally banned in favor of movements which can be carried out voluntarily, but they are used, in suitable cases, for those physiologic movements of joints which are without direct muscle control, and also extensively in paralytic cases before the stage at which reeducation becomes possible. The condemnation of passive movements has been much too sweeping, with disastrous consequences for some patients with lower motor neuron paralysis.

During the recovery of joint injuries, accidental or operative, the girth of the joint, the girth of the muscles, the angle of movement and the muscle power are measured weekly by one physical

therapist, using standardized methods and the measurements of the normal and pathologic limb are charted. The charts are valuable, especially in recording the progress of muscle power, a factor which is often neglected in evaluating a patient's fitness for duty.

Factors Promoting Venous Return From the Arm in Man. E. Bowers; E. J. M. Campbell, and C. H. P. Johnston.

Lancet **15**:461 (April 14) 1945.

Under conditions of rest venous pressure in a limb is governed by the tone of the small peripheral vessels. When this tone is diminished and the vessels are dilated, arterial pressure is transferred to the venous side more completely than when tone is high.

Experiments indicate that two factors are involved in venous return in exercise: (a) dilatation of peripheral vessels increases the vis a tergo, (b) the combination of venous valves and contracting muscles greatly facilitates the venous return.

Exercises in Dysmenorrhea. John O. Haman.

Am. J. Obst. & Gynec. **49**:757 (June) 1945.

The exercises, which have been devised for the relief of dysmenorrhea, are simple to perform; they take less than five minutes a day and require a minimum of space; they may be done at home and need be carried out usually for only two or three months before improvement results.

The patient stand at right angles to the wall at such a distance as will enable her to comfortably rest her left elbow on the wall on a level with her shoulder. The pelvis is tilted forward and, while in this position, the patient touches the wall with her hip, keeping her knees straight. Care must be taken not to twist the body, or allow the elbow to slide up or down along the wall.

The same procedure is repeated using the right elbow.

The patient faces the wall against which she rests both elbows. The pelvis is tilted and the patient stretches until her pelvis touches the wall. The heels remain on the floor and the knees are kept straight.

Each position is assumed three times and all are repeated three times a day.

Rheumatism: Postgraduate Instruction. Adolphe Abrahams.

Brit. M. J. **4401**:672 (May 12) 1945.

There is suggested a survey of the recent trends in etiologic concepts in acute and chronic rheumatism and arthritis, including toxic, metabolic, climatic, dietetic, and traumatic factors and possibilities. The classification and pathology of acute and chronic rheumatic diseases (including gout and spondylitis), including morbid anatomy and histology should be included.

Applied anatomy and physiology would cover surface anatomy; body mechanics and posture; the structure and action of muscles and joints; the skin and its reactions; the blood, the circulation and respiration as they affect the locomotor system; the nervous system with reference to segmental and peripheral nerve distribution, and pain, the methods of causation, transmission, reference and clinical application; the normal radiology of bones and joints and the radiology of the rheumatic and pseudorheumatic diseases.

The chief rheumatic diseases should be dealt with during the course in general medicine. Such "rheumatic symptoms" as occur in poliomyelitis, tuberculosis, gonorrhea, osteomyelitis, leukaemia, may be mentioned. Standardized history-taking and the recording of symptoms should be presented. Orthopedic aspects would include postural and congenital abnormalities and chronic strain. Neurologic aspects would include neuritis, prolapsed disks, "hysterical" joints, the mechanism of pain reference, muscular dystrophies and sciatica.

Physical medicine would include demonstrations of apparatus and methods in use; remedial exercises and physiologic rest; the writing of prescriptions; reeducation of muscles and joints and occupational therapy; reconstructive surgery of joints; specialized methods of treatment: gold salts; procaine injection; aspiration of joints; simple plaster work; vaccines; manipulation and the prophylaxis and treatment of acute rheumatic fever.

Fibrositis.

Brit. M. J. **4404**:775 (June 2) 1945.

Attention is called to the problem of fibrositis, and the scepticism as to its being a definite pathological entity is giving way under the pressure of facts as presented by Copeman and Ackerman. They have supported their clinical observations by research into the anatomy and pathology of fibrositis, by necropsy and biopsy. Attention has been concentrated on the painful nodules often found in fibrositis. The histologic characters were fully described by Stockman, though they have been sometimes described as structures found by the fingers of the physician but not by the surgeon's scalpel. Clinicians were reluctant to ascribe the pain and stiffness of fibrositis to these nodules, or to believe that organized fibrous structures could be broken down and the symptoms relieved by heavy massage.

The work of Sir Thomas Lewis on referred pain, amplified by Kellgren, who demonstrated the relation between localized tender spots and referred sciatic pain, aroused fresh interest, and Elliott threw further light on the matter by demonstrating that these spots were associated with areas of increased excitability in the corresponding segment of the spinal cord. Copeman and Ackerman have shown that these "trigger points" are associated with certain areas of the back where pink fatty tissue of a particular type lies between the superficial and the deep fascia. The fat is vascular and liable to become edematous and congested, and may thus narrow the lumen

cope with them sensibly." The author carefully points out that she is not trained in medicine and that she is trying to present the common medical problems of women, using the best authorities that she could find in putting this information into language easily understood by the average reader. She does not attempt to give the exceptions nor discuss diverse opinions. She discusses the various problems in a sensible, simple manner at all times urging proper medical care. She attempts to debunk some of the old unproved statements relative to some of the common ailments of women.

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The Spas and the People.

Brit. J. Phys. Med. **8**:33 (March-April) 1945.

A health conscious nation, seeking the optimum in mental and bodily fitness, looks to the amenities of climate, situation, soil and atmosphere of its geographical position and tries to make use of whatever there may be available.

There is suggested five or six classes of invalid, temporary and partial, which can be differentiated, and for each class the spa has benefits to offer. If the fit person is regarded as being in the index of 100, there are various grades of people according to the ratable value of their general health. There must be a great army of people, who are just tired and want to recover pleasantly from fatigue, who may be placed in the 80 to 90 index. Convalescents from illness and accident, each has his own index. Thirdly there is the mild but partly incapacitating illness, which causes loss of ordinary "living time." In this group the early fibrositics and arthritics may be found and when they reach the spa their index may be as low as 40. Another group contains people who have some irreversible process at work but who might be made up to the fullness of their own power by spa treatment. Added to the purely physical benefits of a spa, there are also available the benefits of a holiday and not a hospital environment, healthy leisure with amusements such as good music and suitable diet, exercise and recreation.

Chest Pain and Heart Disease. Treacy H. Duerfeldt.

Northwest Med. **44**:188 (June) 1945.

Bursitis, myalgia or arthralgia of the left shoulder may be mistaken for coronary trouble when the patient complains of pain on walking, since swinging the arm or other exercise tends to bring on the pain. More confusing is the picture when the middle aged person complains of the shoulder pain, aggravated by such exercise as reaching up, and you even find the deltoid muscle tender to touch, yet the trouble is coronary insufficiency and there has developed the uncommon spasm of the pectorial and deltoid muscles as a reflex condition.

Spondylitis or spinal arthritis is known to cause root pains which are increased by movement. When these occur in the chest, we must be sure to ask whether the pain is increased by all movements or only by such exertions as walking, and the differentiation made. Similarly, the type of exertion or movement must be investigated, when the patient with an old spondylitis involving the lower back begins to complain of chest pain. This may be due to coronary disease.

Chronic Headaches. John R. Williams, Jr.

North Carolina M. J. **6**:241 (May) 1945.

Numerous investigators, including Cyriax, have pointed out that cervical arthritis and myositis in the neck can produce typical vascular headaches. In such cases tender areas are usually present in the neck, and movement of the neck is painful. Heat, especially in the form of diathermy and deep massage to the neck muscles are of value in treatment. Occasionally good results can be obtained by the injection of these tender areas with large amounts of novocaine or nupercaine in oil.

Treatment of Deafness, Ear-Noises and Dizziness by Hypothermic Therapy. Sverre Quisling.

J. Lancet **65**:222 (June) 1945.

Hypodermic therapy is based on three well-known and proven physiologic phenomena: The phenomenon of paracusis Willisii, i. e., the well known improvement in hearing noted by sufferers of otosclerosis in the presence of loud noises such as experienced when riding in trains, in the presence of loud music, or when working in factories; the marked stimulating effect of cold water run into the external ear as induced by a nystagmus due to stimulation of the vestibular division of the eighth nerve; the proven fact that interference with the circulation of the labyrinth will cause deafness, head-noises and dizziness, varying in degree with the extent of the anemia induced. The reason for using cold to stimulate the eighth nerve was the well-known sensitivity of the vestibular division of the eighth nerve to cold, a sensitivity also found to be present in the cochlear division. Furthermore, since the symptomatology of deafness, head-noises and dizziness in general follows anemia of the nerve endings of the eighth nerve, when the blood supply is increased, such symptomatology might reasonably be expected to be reversed.

After thoroughly testing the ears to remove all possible etiologic factors which will enhance return to normal hearing, a tube of ethyl chloride is obtained and the skin surface posterior to the external ear over the vestibular petrous portion and mastoid portion of the temporal bone is sprayed until it blanches. The skin is allowed to thaw out about one-half to one minute when the area is warmed by the hand of the operator. The procedure is repeated two or three times over each ear area. In thin-skinned individuals it is advisable to warm the skin with the hand immediately after it blanches, to prevent frostbite. The treatment is repeated once or twice per week for a period of six to twelve treatments. If improvement is noted, the treatments are con-

tinued for a period until no further improvement is necessary. The treatments may be repeated at monthly intervals thereafter from three to six months to insure that the condition will be relatively permanent.

After-Results of Treatment of Severe Lupus With Finsen Light (8 Cases). A. Burrows.

Proc. Roy. Soc. Med. **38**:145 (Feb.) 1945.

These cases of lupus vulgaris illustrate how good the results of treatment may be, even where the disease is advanced. Seven of them are also in contrast with the only male patient, who has a recurrent nodule in a nasal skin graft.

There is some criticism of the use of Finsen light in such cases; it is said that it is only valuable in the early condition, but these patients show the results which can be obtained in later cases.

Effects of Temperature Change on the Water Balance in Man. C. Lockard Conley, and John L. Nickerson.

Am. J. Physiol. **143**:384 (March) 1945.

The extrarenal water loss was quite constant during any period of uniform temperature. On change of the environmental temperature, the extrarenal water loss and the skin temperature quickly attained new levels. There was no evidence of slow acclimatization.

The renal excretion of sodium and chloride appeared to reflect the difference between the intake of these substances and the quantities lost in the sweat.

A pronounced and prolonged increase in plasma volume was found on exposure to heat. On exposure to cold the plasma volume was reduced but tended to return toward normal within a few days.

Spa Treatment and the Injured Workman. G. R. P. Aldred-Brown, and J. Bastow.

Brit. J. Phys. Med. **8**:36 (March-April) 1945.

Spa treatment means treatment at a spa. Although the spas in Great Britain are few in number and although still fewer have the requisite medical and surgical skill combined with their hydrologic facilities, spas should take a share in any national rehabilitation scheme. For large numbers of injured workmen the spa should be the accelerator of clinical progress and the means to ensure a rapid return to work.

Two examples are given of injuries involving joints, (a) internal derangements of the knee. (b) The "sprained" shoulder, associated with an incomplete tear of the supraspinatus muscle, and the shoulder stiff from periarticular adhesions which needs to be broken down under an anesthetic. In both, the movements difficult to regain, of the shoulder, take place when assisted by the effect of the water.

Complicated fractures, especially compound injuries with extensive muscle and tendon damage respond to hydrotherapy.

After removal of a plaster spica applied for fixation of a compound fracture of the humerus or of the femur, there is always an awkward period when the injured man misses the support of the plaster. The effect of immersion in a bath assists efforts to regain movement in the stiff joint, to exercise the weak muscles and to walk without external support.

Muscular and ligamentous injuries of the spine benefit from hydrotherapy. These are associated with anxiety states out of all proportion to the severity of the injury. The sense of wellbeing, absence of nocuous stimuli and ease of movement induced by the hot pool do much to alleviate the mental stress and encourage the man to regain free spinal movement. This is especially true after manipulation under anesthesia in order to break down adhesions.

Injuries complicated by paralysis are discussed. All paretic cases respond admirably to release from the drag of gravity. Two examples are deltoid paralysis after shoulder dislocation and footdrop after external popliteal paralysis.

Spa treatment is ideal for many kinds of injury to the workman; its efficacy secures confidence and stimulates desire for early recovery.

Lupus Erythematosus Disseminatus. Randolph P. Pillow, and Lester J. Palmer.

Northwest Med. **44**:143 (May) 1945.

The present therapy of the disseminated type is largely supportive and consists of bed rest and avoidance of ultraviolet light, adequate high calory diet, blood transfusions as needed, salicylates and codeine, avoidance of parenteral use of heavy metals and removal of any infectious focus during quiescent periods. Cannon recently reported improvement by the use of iodine orally.

Rehabilitation in a Naval Hospital. H. Jackson Burrows.

Lancet **12**:371 (March 24) 1945.

The important part of the duties of the physical therapist is instruction in and supervision of progressive exercises. The opposite popular tendency, the almost total neglect of such accessory methods as heat and electrical stimulation, is also avoided.

Passive movements, except as manipulations under anesthesia, are generally banned in favor of movements which can be carried out voluntarily, but they are used, in suitable cases, for those physiologic movements of joints which are without direct muscle control, and also extensively in paralytic cases before the stage at which re-education becomes possible. The condemnation of passive movements has been much too sweeping, with disastrous consequences for some patients with lower motor neuron paralysis.

During the recovery of joint injuries, accidental or operative, the girth of the joint, the girth of the muscles, the angle of movement and the muscle power are measured weekly by one physical

therapist, using standardized methods and the measurements of the normal and pathologic limb are charted. The charts are valuable, especially in recording the progress of muscle power, a factor which is often neglected in evaluating a patient's fitness for duty.

Factors Promoting Venous Return From the Arm in Man. E. Bowers; E. J. M. Campbell, and C. H. P. Johnston.

Lancet 15:461 (April 14) 1945.

Under conditions of rest venous pressure in a limb is governed by the tone of the small peripheral vessels. When this tone is diminished and the vessels are dilated, arterial pressure is transferred to the venous side more completely than when tone is high.

Experiments indicate that two factors are involved in venous return in exercise: (a) dilatation of peripheral vessels increases the vis a tergo, (b) the combination of venous valves and contracting muscles greatly facilitates the venous return.

Exercises in Dysmenorrhea. John O. Haman.

Am. J. Obst. & Gynec. 49:757 (June) 1945.

The exercises, which have been devised for the relief of dysmenorrhea, are simple to perform; they take less than five minutes a day and require a minimum of space; they may be done at home and need be carried out usually for only two or three months before improvement results.

The patient stand at right angles to the wall at such a distance as will enable her to comfortably rest her left elbow on the wall on a level with her shoulder. The pelvis is tilted forward and, while in this position, the patient touches the wall with her hip, keeping her knees straight. Care must be taken not to twist the body, or allow the elbow to slide up or down along the wall.

The same procedure is repeated using the right elbow.

The patient faces the wall against which she rests both elbows. The pelvis is tilted and the patient stretches until her pelvis touches the wall. The heels remain on the floor and the knees are kept straight.

Each position is assumed three times and all are repeated three times a day.

Rheumatism: Postgraduate Instruction. Adolphe Abrahams.

Brit. M. J. 4401:672 (May 12) 1945.

There is suggested a survey of the recent trends in etiologic concepts in acute and chronic rheumatism and arthritis, including toxic, metabolic, climatic, dietetic, and traumatic factors and possibilities. The classification and pathology of acute and chronic rheumatic diseases (including gout and spondylitis), including morbid anatomy and histology should be included.

Applied anatomy and physiology would cover surface anatomy; body mechanics and posture; the structure and action of muscles and joints; the skin and its reactions; the blood, the circulation and respiration as they affect the locomotor system; the nervous system with reference to segmental and peripheral nerve distribution, and pain, the methods of causation, transmission, reference and clinical application; the normal radiology of bones and joints and the radiology of the rheumatic and pseudorheumatic diseases.

The chief rheumatic diseases should be dealt with during the course in general medicine. Such "rheumatic symptoms" as occur in poliomyelitis, tuberculosis, gonorrhea, osteomyelitis, leukaemia, may be mentioned. Standardized history-taking and the recording of symptoms should be presented. Orthopedic aspects would include postural and congenital abnormalities and chronic strain. Neurologic aspects would include neuritis, prolapsed disks, "hysterical" joints, the mechanism of pain reference, muscular dystrophies and sciatica.

Physical medicine would include demonstrations of apparatus and methods in use; remedial exercises and physiologic rest; the writing of prescriptions; reeducation of muscles and joints and occupational therapy; reconstructive surgery of joints; specialized methods of treatment: gold salts; procaine injection; aspiration of joints; simple plaster work; vaccines; manipulation and the prophylaxis and treatment of acute rheumatic fever.

Fibrositis.

Brit. M. J. 4404:775 (June 2) 1945.

Attention is called to the problem of fibrositis, and the scepticism as to its being a definite pathological entity is giving way under the pressure of facts as presented by Copeman and Ackerman. They have supported their clinical observations by research into the anatomy and pathology of fibrositis, by necropsy and biopsy. Attention has been concentrated on the painful nodules often found in fibrositis. The histologic characters were fully described by Stockman, though they have been sometimes described as structures found by the fingers of the physician but not by the surgeon's scalpel. Clinicians were reluctant to ascribe the pain and stiffness of fibrositis to these nodules, or to believe that organized fibrous structures could be broken down and the symptoms relieved by heavy massage.

The work of Sir Thomas Lewis on referred pain, amplified by Kellgren, who demonstrated the relation between localized tender spots and referred sciatic pain, aroused fresh interest, and Elliott threw further light on the matter by demonstrating that these spots were associated with areas of increased excitability in the corresponding segment of the spinal cord. Copeman and Ackerman have shown that these "trigger points" are associated with certain areas of the back where pink fatty tissue of a particular type lies between the superficial and the deep fascia. The fat is vascular and liable to become edematous and congested, and may thus narrow the lumen

of the tendon sheaths and cause stiffness and pain. A similar effect may arise in other situations and this furnishes a far more convincing explanation of the characteristic symptoms of acute lumbago than many other theories. This underlying fat, when congested and swollen, tends to bulge through any weak spots or deficiencies in the enveloping fibrous layers or through the foramina which give passage to the nerves and blood vessels; these herniations form tender nodules and trigger points.

Second Attack of Poliomyelitis After Thirteen Years. J. Wyllie.

Canad. Pub. Health J. **36**:131 (April) 1945.

A woman at the age of 32, developed a second attack of poliomyelitis, having had a first attack thirteen years previously at the age of 18. The first attack, which had developed after intimate contact with a sister who had a paralytic attack of poliomyelitis, had left the patient with wasting and flabbiness of the calf muscles of the right leg but with little loss of function. The patient walked with a slight limp. During the second attack, examination revealed a partial paralysis of both legs and weakness of the lumbar muscles. Wyllie reports that treatment with the Kenny packs was begun on the day of admission and continued daily for twenty-five days. On her discharge from the hospital there was some loss of power in the extensor muscles of the right thigh and loss of power in the left thigh muscles but improvement in the muscles of the lumbar region.

The Electrical Activity of Voluntary Muscle in Man Under Normal and Pathological Conditions. G. Weddell; B. Feinstein, and R. E. Pattle.

Brain **67**:178, 1944.

Electromyography is the recording of electric potentials produced during muscle contraction (action currents). Their significance is given by the fact that such contracting muscle fiber always produces an action current, so that by electromyography a detailed picture is given of the muscle contractions without interfering with the muscle function. There are different methods to pick up these action currents from the muscle. The authors use so-called concentric needle electrodes, inserted into the muscle. After amplification, the currents are made visible by an oscillograph and audible by a loudspeaker. Muscle action currents as obtained by the technic of the authors can be divided into major classifications: 1. Motor unit action potentials are due to contraction of all muscle fibers (160-200 or more) innervated by one nerve fiber (Sherrington's motor unit). They are seen in fasciculation and in general when an active nerve fiber exists. 2. Fibrillation action potentials are due to contraction of individual muscle fibers. They are smaller and of shorter duration than the motor unit potentials and are generally found in denervated muscle fibers.

The difference is clearly audible, the fibrillation action current sounds like a sharp click, the motor unit potential sounds like a much lower sound. A third typical sound is often heard in muscles when reinnervation has just started.

In the normal muscle weak voluntary contractions produce motor unit potentials at different rates. Everyone with experience in this field will agree with the fact that it is possible to obtain in a normal muscle a position in which no action currents occur. The interpretation, however, gives difficulties. The authors stress that in the zero action current position the muscle still has tone. They stress the importance of such things as intra and extravascular fluid within the muscle sheath, and rheologic properties of the muscle as responsible for muscle tone. There are some muscles, however, in which a zero action current is hard to obtain, such as some muscles of the neck and the larynx.

It should be noted that the type of electrode used limits the part of the muscle from which pick up occurs to the immediate neighborhood of the needle tip (1 to 2 cm.). The needle has to be moved to obtain records from different parts of the same muscle. On the other hand, the localized pick up contributes considerably to the simplicity of the records.

Of particular interest are the records obtained from denervated muscles. About two weeks after denervation fibrillation action currents occur which may be seen until reinnervation occurs. This does not necessarily mean that fibrillation can always be seen by direct observation of the muscle, it may be too weak for that. As recorded by action currents, however, fibrillation occurs in every case of denervation. It has been observed by the authors in a case of infantile paralysis eighteen years after the occurrence of the paralysis.

The fibrillation usually becomes weaker as time goes on. Heat increases it and brings it out in cases where it can be recorded only with difficulty. Cold reduces it.

The application for a few weeks of intensive physical therapy (radiant heat, massage, galvanic stimulation and passive movements) gave strong fibrillation in the treated muscles. The authors stress the fact that there is no relation between the occurrence of fibrillation and the prevention or reduction of atrophy. In this they confirm previous work done by others. Fibrillation can also be obtained from partially denervated muscles.

When reinnervation occurs the fibrillation potentials begin to disappear before the return of motor unit activity. When they reappear the motor unit potentials are sometimes hard to distinguish from fibrillation potentials. Often typical polyphasic potentials are found. Voluntary function reappears after the recurrence of motor unit potentials. The interval between the two varies.

Sometimes it is possible to obtain evidence of local muscle spasm in low back pain or sciatica. The authors suggest that besides this mechanism similar mechanisms in the sensory nerves exist.

The Scalenus Anticus Syndrome With and Without Cervical Rib. J. G. Love.

Proc. Staff Meet., Mayo Clin. **20**:69 (March 7) 1945.

All patients who have cervical ribs do not require treatment. In fact, many persons have cervical ribs and never know it. Others learn the fact for the first time when a roentgenogram of the thorax or neck is made for some entirely unrelated reason. Patients with mild, symptoms often are benefited by conservative measures, such as lessening the load on the involved shoulder girdle, application of heat locally and sleeping with hands above the head or prone with the arms over the sides of a narrow bed. Others require analgesic drugs such as acetylsalicylic acid. When it has been determined that more radical measures are necessary for relief, scalenotomy with or without removal of the rib is indicated. The anterior approach is the operation of choice even if the rib is to be resected.

The Treatment of Fractures of the Humerous With the Hanging Cast. R. Beverly Raney.

North Carolina M. J. **6**:91 (Feb.) 1945.

For about two years we have treated almost all fractures of the humerus above the supracondylar level with the hanging cast and shoulder exercises. Active exercises form an essential part of the hanging cast treatment. The patient is urged to carry these out twice daily, beginning in a gentle fashion immediately after application of the cast, and continuing more vigorously until full function of the extremity is restored. The shoulder exercises are of two types, circumduction and rotation, and are carried out with the patient standing and leaning forward. In doing the circumduction exercise, the patient swings the entire extremity around in as large a circle as he can make. In doing the rotation exercise, he turns the extremity about the longitudinal axis of the humerus through as great an angle as possible. After removal of the cast, at a period varying widely from about two to about twelve weeks after its application, exercise of the shoulder in other position is added, as are exercises of the elbow and wrist.

Refrigeration Anesthesia in Surgery of the Extremities. S. V. Lobachev.

Am. Rev. Soc. Med. **2**:331 (April) 1945.

There were three deaths among the 100 operative cases. Two of these had undergone a bilateral high traumatic amputation of the thighs associated with brain injury and died twenty-four hours postoperatively. The third succumbed to miliary tuberculosis of the lungs two months following the operation. Not one case of death could be attributed to the anesthesia. It is believed that neither the cooling anesthesia nor the operation under refrigeration led to surgical shock and that considerable improvement of the general condition took place in most of the patients. The beneficial influence of this type of anesthesia on shock is ascribed to the following factors: no anesthetic drugs are introduced into the system; the local reduction of temperature counteracts the traumatic shock by numbing the tissues and especially the nerves and according to Kenyu, histamine is formed from the proteins of the destroyed tissues, the absorption of which causes the blood pressure to fail. As a result of blood stasis in the capillaries, tissue anoxia occurs, capillary permeability increases, and the blood becomes concentrated. In addition, the toxins encourage bacterial growth in the lacerated tissue. The application of the tournique and the cooling of the limb retard the formation and absorption of toxins. Toxemia is reduced and shock controlled.

Refrigeration anesthesia is of great advantage in the aged and those seriously ill with septicemia. Any other form of anesthesia is risky and often fatal in this particular group of surgical patients.

Report on Immersion Foot Casualties From the Battle of Attu. Albert Lesser.

Ann. Surg. **121**:265 (March) 1945.

Two groups of patients with immersion foot have been observed and treated at McCaw General Hospital since June, 1943. The first group consisted of 25 patients who were admitted to the hospital with varying degrees of sepsis and gangrene of the feet, arriving approximately three weeks after having been removed from combat duty on the island of Attu. The second group of patients, numbering 27, consisted of patients admitted here at intervals by transfer from the Northwest Pacific area, with subjective complaints of delayed or latent disturbances of the feet coming on approximately six months or more after exposure during the battle of Attu.

Throughout hospital treatment vascular exercises of the lower extremities were conducted three times a day in an organized class fashion under the direction and supervision of one of the soldiers. As soon as the local condition of the extremities and wounds permitted, patients received physical therapy in the form of whirlpool massage or muscle stimulation as the individual case required.

All of the original group of 25 patients were walking well, without need for crutches, cane or any other type of support at the time of discharge from the hospital. Those patients who suffered loss of distal portions of the feet involving all or any part of the metatarsals were able to walk surprisingly well when, in addition to fitted arch supports, a spring steel longitudinal strip was incorporated in the sole of the shoe. For some patients a transverse leather bar was added to the sole of the shoe, back of the metatarsal heads, in place of the transverse arch support usually placed inside the shoe. This modification seemed to supply a fairly satisfactory substitute for the "spring" of the metatarsophalangeal joints which is probably necessary in the take-off of each step. In those feet in which tarsometatarsal disarticulation was performed, there was no evidence of distorted tendon pull and there was normal stable body weight-bearing on the remnant of the foot.

Changes in Chronaxie During Degeneration and Regeneration of Experimentally Produced Lesions of the Sciatic Nerve of the Cat. Lewis J. Pollock; James G. Golseth, and Alex. J. Arieff.

Surg., Gynec. & Obst. **81**:454 (Oct.) 1945.

The marked lengthening of chronaxie from that of a fraction of a millisecond to that of 100 or more times longer is a clear indication of denervated muscle. The temporary shortening of chronaxie during the course of degeneration of muscle is not a sign of recovery. Significantly great shortening of chronaxie from its final peak of great length is a sign of recovery. This sign of recovery occurs later than signs derived from other electrical examinations, such as tetanus ratio, and may not occur until motor recovery is present. The combination of a low galvanic tetanus ratio with a short chronaxie is characteristic of spontaneously recovering lesions and at times of recovery following operations on injured nerves.

Experimental Studies in Peripheral Nerve Surgery. IV. The Effect of Infection on Regeneration and Functional Recovery. Loyal Davis; George Perret, and Frederick Hiller.

Surg., Gynec. & Obst. **81**:308 (Sept.) 1945.

Infection at the site of repair of a severed peripheral nerve increases the amount of adhesions between the suture line, the graft, and the surrounding tissues. It activates the mesodermal proliferation of the epineurium and the perineurium and produces acute inflammatory reactions within these tissues comparable to an acute and later to a chronic perineuritis. The perineurium and the epineurium act as a barrier to infection and inflammation and at no time does the infectious process penetrate the nerve fascicles. A peripheral nerve is more resistant to infection than are muscle, tendon, fat, or fascia. It may be found intact within an abscess cavity even after repair by end-to-end suture or the transplantation of a graft.

Bed-Rest in Tuberculosis. Its Dangers and Proprieties. William M. Peck, and Henry Stuart Willis.

Am. Rev. Tuberc. **52**:20 (July) 1945.

Pulmonary infarction and embolism of the pulmonary artery were found in 1.5 per cent of 751 autopsies on tuberculous persons. Certain other dangers may be associated with bed-rest in this disease. Among these are the failure to obtain adequate pulmonary drainage; to meet emotional maladjustment and to correlate properly collapse therapy and a bed-rest regimen. The evils which adhere to bed-rest are incident to its mode of application. Good bed-rest will avoid these dangers and retain its full therapeutic value. Poor bed-rest is often therapeutically inert and can be aptly called bed-fatigue. Proper bed-rest should include mental repose, muscular relaxation and adequate pulmonary drainage and should not be thought of as mere regimentation in recumbency. Bed-rest is inherently valuable but unreliable when administered indifferently. It warrants constant, critical attention by the physician in order to insure good results.

Effect of Exercise Upon the Erythrocyte Sedimentation Rate. William A. Black, and Peter V. Karpovich.

Am. J. Physiol. **144**:226 (July 1) 1945.

With the introduction of a physical training program for convalescents into army hospitals, it is of practical importance to know more about the relation between the erythrocyte sedimentation rate and exercise.

Fifty aviation cadets, convalescing from upper respiratory infection, were given five minutes of strenuous exercise (the Harvard step-up test). Blood samples were taken immediately before exercise, and half an hour, five hours and twenty-four hours following exercise. The erythrocyte sedimentation rate was determined by the Westergren method. Five minutes of strenuous exercise caused a variable effect upon the individual sedimentation rate. In the group tested there was a statistically significant increase in erythrocyte sedimentation rates five hours following exercise but no significant change either half an hour or twenty-four hours following exercise. This indicates that the change is not lasting. Observations of post-exercise showed no clinical manifestations of ill effects. Data on 39 subjects showed that there was no relation between the erythrocyte sedimentation rate before exercise and the score obtained on the Harvard step-up test. The contradictions regarding the effect of exercise on the erythrocyte sedimentation rate found in the literature may be explained by the difference in the intensity of exercises and in the time of taking the blood samples.

Lumbar Sympathetic Dermatomes in Man Determined by the Electrical Skin Resistance Method. C. P. Richter, and B. G. Woodruc.

J. Neurophysiol **8**:337 (Sept.) 1945.

The mode of distribution of the sympathetic nerves to the skin has not been well understood. This has been due in part to the lack of a simple and accurate method of outlining areas of increased or decreased activity of the sympathetic nervous system and also to the lack of opportunity to make observations on individuals with lesions at the various levels of the chain. These two difficulties have been partly overcome by the use of the electrical skin resistance method which makes it possible to obtain sharply defined outlines of areas affected by sympathectomy, and by the opportunity to make observations on a large number of persons with sympathectomies performed at almost all levels of the sympathetic chain.

The present study deals only with the five lumbar and the first sacral dermatomes. Records taken over a five-year period on 75 patients with a total of 103 operations at all levels from L_1 to S_1 inclusive constitute the data on which this study is based.

"Orthopaedic" Rehabilitation. F. G. Ward.
Brit. M. J. 4415:227 (Aug. 18) 1945.

Function in the human body is dependent on use. If a limb is not used it withers. By immobilizing a part of the body in the treatment of a skeletal injury we are inviting it to wither. Loss of function during immobilization can be minimized and ultimate recovery speeded to completion by supervised active exercise. The first objective therefore is maintenance. Muscle wasting and loss of blood supply in immobilized joints must be kept to a minimum during the fixation period by regular active muscular exercise. The second objective, which emerges when fixation is removed, is restoration of function by redeveloping power, mobility and coordination in the injured part. Experience has shown that generally speaking, the redevelopment of muscular power is the most important of the three. To insure that every fiber is brought into play, exercises should be performed with the maximum of effort, well sustained and followed by a period of relaxation. With a leg in plaster, light movements of the toes are a waste of time. The toes must regularly be tightly flexed and vigorously extended.

For the patient in bed the simplest exercises suffice, but they must be supervised. Five minutes every hour, at the hour, is recommended.

The physical therapy technician is concerned with active exercises. The paraffin bath has been found satisfactory. Reeducation embraces the treatment of weak muscles in all types of disability, from the flicker of recovery after paralysis to temporary inhibition by operation. Special apparatus is not essential for this, but some form of frame for the suspension of the affected limb in slings is useful; for, in a limb so suspended, gravity and the muscles needed to counter it are eliminated, allowing even the weakest muscles to produce movement. The exercises must be progressively graded up in power and duration as the muscle recovers, to insure that the patient does not get the chance to use sling suspension as a convenient form of rest cure. The frame is also useful for the attachment of helical springs for resisted exercises.

Rehabilitation methods based on experience at a Royal Naval hospital and its annexed orthopedic rehabilitation center are described.

The importance of prescription and of personal interest in the individual patient is emphasized, and a plea is put forward for the inclusion of active rehabilitation in the treatment of injuries in domiciliary practice.

Spa Treatment—Kovács

(*Continued from page 687*)

Comment

The presentation of the data about Spa treatment of rheumatic diseases in six American Spas reveals conditions characteristic about the present status of American Spas. Of the six Spas described, one is owned and fully supervised by the United States Government, one is owned and operated by a State, one is owned and operated by a municipality and supervised by the United States Government and three are privately owned and operated. They all appear to be under adequate medical direction for admission of patients as well as for the supervision of treatments. Their therapeutic facilities are comparable to those of the favorably known Spas abroad and they also possess a reasonable amount of recreational facilities. There exists no generally accepted routine for the laboratory study and selective treatment of rheumatic diseases, but their clinical handling appears to be adequate for practical purposes. It is hoped that at a future time it will be possible to publish additional data about a few more Spas, which may be regarded as representative. This was not possible in this series because some of these Spas are now used by the armed forces exclusively for rehabilitation, while in a few others medical direction is inadequate at present and thus no competent survey of their facilities is obtainable.

In striving towards the goal of a high standard of service American Spas might just as well begin by comparing notes as to the diagnostic and therapeutic care of the rheumatic group of patients and endeavor enlisting the active cooperation of medical and health organizations towards combating the physical and economic losses caused by chronic rheumatism. There is undoubtedly much room for further improvement and expansion of the health restoring routine of many of our American resorts.

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Walter J. Zeiter, M.D., Chairman.
Earl C. Elkins, M.D.
Richard Kovács, M.D.
Fred B. Moor, M.D.
Emil J. C. Hildenbrand, M.D.

Membership

Richard Kovács, M.D. Chairman.
Wayne McFarland, M.D.
Isadore Levin, M.D.
B. S. Troedsson, M.D.

Military Problems

Major O. L. Huddleston, (MC), Chairman
Lieut. Comdr. Edward Lee Alexander, (MC), U. S. N. R.
Lieut. Col. Ben Boynton, (MC).
Comdr. Rodney Chamberlain, (MC), U. S. N. R.
Lieut. Comdr. R. E. Kinneman, (MC), U. S. N. R.
Major Donald Rose, (MC).
Lieut. Col. Norman E. Titus, (MC).
Lieut. Comdr. John F. Wyman, (MC), U. S. N. R.

Nominating

K. G. Hansson, M.D., Chairman.
Fred B. Moor, M.D.
Nathan Polmer, M.D.
John S. Coulter, M.D.
Frederick L. Wahrer, M. D.

Problems Affecting Technicians

Nathan H. Polmer, M.D., Chairman.
Frances Baker, M.D.
Wm. Benham Snow, M.D.

Public Relations

Wm. H. Schmidt, M.D., Chairman.
H. Worley Kendell, M.D.
Robert L. Stecher, M.D.
William Northway, M.D.

Scientific Exhibits and Gold Key Awards

Wm. H. Schmidt, M.D., Chairman.
Disraeli Kobak, M.D.
Albert A. Martucci, M.D.
William D. Paul, M.D.
Madge C. L. McGuinness, M.D.